

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

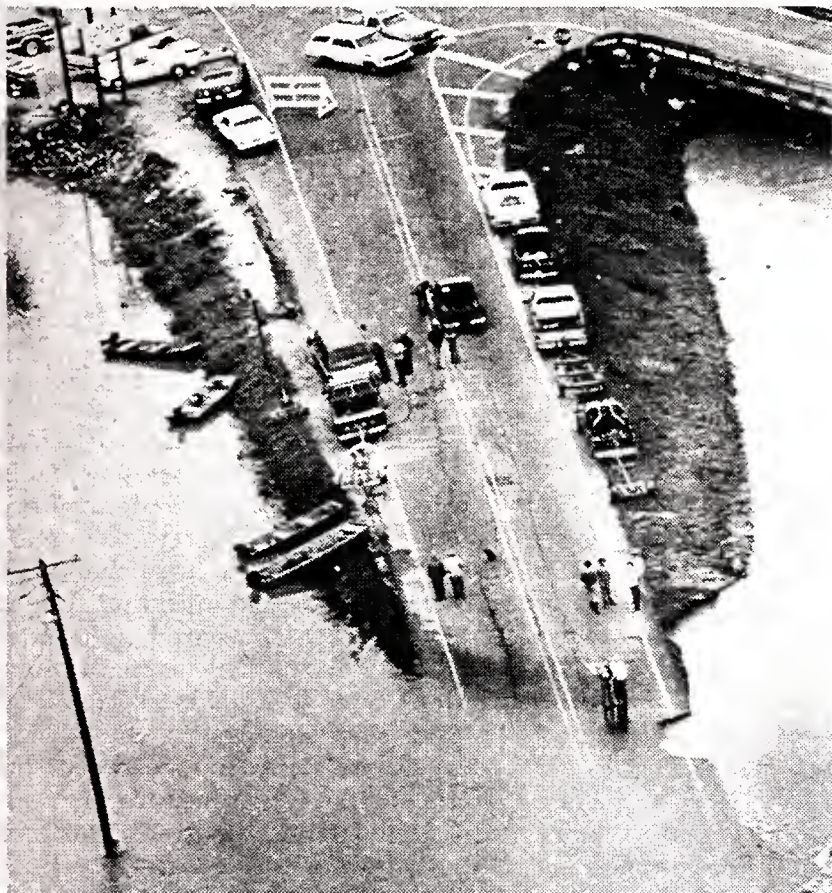
Weekly Newspaper

Second-class postage paid at Framingham, Mass. and additional mailing offices ©1983 by CW Communications/Inc.

\$1.50 a copy; \$44/year

April 18, 1983

Vol. XVII, No. 16



Wide World Photo

Total Washout

Louisiana Highway 16 became a dead-end road after 24 inches of rain swelled the state's rivers and flooded the highways. In New Orleans, DP operations came to a standstill when telephone lines went down and workers could not get to their jobs. Story on Page 20.

Micros Tied to Mainframes

• *IBM Micro Linked To M&D Data Bases*

By Paul Gillin
CW Staff

NEEDHAM, Mass. — McCormack & Dodge Corp. has announced a link between its mainframe financial software data bases and the IBM Personal Computer.

The bisynchronous Interactive PC Link offers downloading of selected files to the Personal Computer and real-time uploading of files for updating the mainframe data base.

The link runs in conjunction with the company's Advanced Financial Systems design methodology under Hilite, an on-line query system for McCormack & Dodge financial packages. The first application will be with the latest version of the company's G/L Plus general ledger system.

The package includes a customized version of the Lotus Development Corp. 1-2-3 spreadsheet, data base management and graphics package. McCormack & Dodge will provide the Lotus software and software/hardware interfaces as part of an agreement in which McCormack & Dodge will act as a value-added remarketer for Lotus products.

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• *Package Hooks Up IBM Micros, CPUs*

By Lois Paul
CW Staff

WOODLAND HILLS, Calif. — Software that links IBM Personal Computers and large data bases on IBM mainframe computers was unveiled last week by Visicorp and Informatics General Corp. as the first product of a joint development agreement between the two firms.

The components of the linking software include two cooperating software packages: Visianswer, a new package from Visicorp that operates on the IBM Personal Computer; and Answer/DB, an existing Informatics product that runs on any IBM mainframe or plug-compatible mainframe.

The user employs Visianswer to formulate queries and select the data he needs from the mainframe data base. Answer/DB selects and extracts the data from the data base, summarizes it and downloads it to the Personal Computer that is running Visianswer. Communications with the IBM mainframe and Answer/DB are handled by Visianswer, and the extracted and summarized data is stored in the Personal Computer's floppy diskette in a format that is usable with the full line of Visieries applications on the Personal Computer.

Answer/DB was designed to provide access to a variety of mainframe files and data bases, including IBM's IMS and DL/1, Cullinet Software, Inc.'s IDMS and files accessed by Vsam, Isam and other standard IBM access methods. It will initially operate under the IBM IMS/DC telecommunications monitor, the vendor noted, with CICS, CMS and TSO versions planned for the future.

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Amdahl Unleashes IBM 3725 Rival

By Jeffry Beeler

CW West Coast Bureau

SUNNYVALE, Calif. — Amdahl Corp. today introduced an IBM 3705-compatible communications controller that is said to provide 20% greater throughput and cost 12% to 15% less than IBM's recently unveiled 3725 front-end processor.

Amdahl has also increased the asynchronous communi-

cations speeds on its front-end processor family to 9,600 bit/sec and added an Integrated Line Switch that reportedly dispenses with costly external switches. The ILS and the expanded communications support have been added both to Amdahl's existing 4705 front-end processor and to its newly introduced sister system — the 4705E, a spokesman said.

With its 145-nsec processor, the 4705E outperforms IBM's 3705 by 2.4-fold and the 2½-year-old 4705 by 33%, the spokesman claimed.

Like IBM's 3725, which was announced early last month to replace the aging 3705, the 4705E also reportedly holds up to 1M byte of main storage, twice the capacity of the 4705. The latest Amdahl communications

controller requires at least 256K bytes of internal memory and expands in 256K-byte increments.

Users of the IBM-compatible processor vendor's original 4705 can upgrade their machines in the field to a 4705E simply by swapping printed-circuit boards, the spokesman said.

Said to occupy roughly as much floor space as the 3725,

(Continued on Page 2)

Product Spotlight

SNA Compatibility Growing

By Jim Bartimo
CW Staff

One industry expert referred to it as IBM's "System for Negating Alternatives." Others, mainly competing vendors, did not speak so lightly of the computer giant's Systems Network Architecture, a pervasive and formidable force in the world of communications.

But if IBM indeed designed SNA to keep other hardware vendors out of IBM networks, its strategy is not working very well. Al-

ternatives to IBM hardware in an SNA network are becoming less and less negated as more and more vendors become SNA-compatible.

And with so many vendors offering equipment that is SNA-compatible, many industry experts predict that it is just a matter of time before SNA becomes the de facto world communications standard.

Why? "It's a simple fact of life," said William Zachmann, vice-president of technology assessment for

International Data Corp. in Framingham, Mass. "If you want to sell communications equipment, 60% to 70% of computer environments are IBM-compatible. Any vendor that wants to stay in the market has to become SNA-compatible or sacrifice three-quarters of the market."

There are basically two ways a vendor can become SNA-compatible, explained Dale Kutnick, vice-president and director of research at the

(Continued on Page 19)



Photo by M. Gaffney

Is there a personal computer in the works at AT&T? CW Senior Editor Phil Hirsch asked Archie McGill that question when he interviewed the president of American Bell, Inc.'s Advanced Information Systems division. See Page 15 for McGill's answer.



COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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Second-class postage paid at Framingham, Mass., and additional mailing offices. Computerworld (ISSN: 0010-4841) is published weekly, except February (5 issues), April (5 issues), May (6 issues), June (5 issues), August (7 issues), September (5 issues), October (7 issues), November (5 issues), December (4 issues) and a single combined issue for the last week in December and the first week in January by CW Communications/Inc., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

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Special requests should be addressed to Nancy M. Shannon, CW Communications/Inc., Box 880, 375 Cochituate Rd., Framingham, MA 01701. ISSN 0010-4841/82 \$3.00 + \$5.00.

\$1.50 a copy U.S. — \$44 a year, Canada, Central & So. America — \$110 a year, Europe — \$165 a year, all other countries — \$245 a year (airmail service). Four weeks notice is required for change of address. Please allow six weeks for new subscription service to begin.

POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, Circulation Dept., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

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Information Science, Xerox Walk Away With ICP's \$100 Million Awards for Sales

By Bill Laberis
CW Staff

SCOTTSDALE, Ariz. — There were fewer awards given this year compared to last year, but the mood was still upbeat as International Computer Programs, Inc. (ICP) honored 266 software products at its 12th annual Million Dollar Awards ceremony here last week.

Two vendors walked away with \$100 million awards, which were the highest presented at this year's event. These firms were Information Science, Inc. for its Insci Human Resource System and Xerox Computer Services for its Business Management System.

The awards are presented to the vendors of products that have achieved various sales milestones since their introduction, starting at the \$1 million sales mark and reaching up to \$250 million or more.

There were, however, no such \$250 million awards this year. Cincom Systems, Inc. won such an award at last year's ceremony, when a total of 342 awards were presented.

\$50 Million Awards

Last week, \$50 million awards were made to 11 vendors in all, almost doubling the number awarded in 1982. Winners and their products in this category included: Applied Data Research, Inc. for Roscoe; Bowne Information Systems, Inc. for Word/One; Computer Associates International, Inc. for Ca-Sort; Comserv Corp. for Amaps; Execucom Systems Corp. for IFPS; Information Builders, Inc. for Focus; Martin Marietta Data Systems, Inc. for Manufac-

turing Control System; McCormack & Dodge Corp. for G/L Plus; MSP, Inc. for Datamanager; Rand Information Systems, Inc. for Comprehensive Industry Distributive System; and Software International Corp. for General Ledger and Financial Reporting System.

Applied Data Research was the only vendor to be awarded a \$50 million presentation two years in a row, earning laurels last year for its Librarian package.

In the \$25 million category, 14 companies received awards, half the

number to receive \$25 million presentations last year. And 36 products were cited in the \$10 million category.

The lion's share of the awards, 112 in all, went to the vendors of products that crested the \$1 million sales mark for the first time. Since the awards ceremony began 12 years ago, some 1,016 products have reached the \$1 million plateau.

There were 34 million-in-one-year awards handed out to products that were introduced in 1982 and exceeded \$1 million in sales by year's end.

IBM 3275 Rival Unleashed

(Continued from Page 1)

the 4705E supports the 3705 versions of IBM's Network Control Program (NCP), Advanced Communication Function (ACF), Emulation Program (EP) and Partitioned Emulation Program (PEP). The 4705E's ability to execute 3705-style software thus makes the Amdahl processor incompatible with the 3725, which boasts its own unique versions of NCP, ACF, EP and PEP.

On the surface at least, this incompatibility with the 3725 would seem to be a serious disadvantage. But the software similarity between the 4705E and 3705 can prove highly beneficial by protecting Amdahl customers from expensive and painful program conversions that the users' IBM counterparts may find themselves unable to avoid.

Customers who want to transform their 4705 into a 4705E can do so without replacing any of their exist-

ing programs since both Amdahl front ends use exactly the same code.

Among its other features, the 4705E supports as many as 352 half-duplex transmission lines that communicate asynchronously at up to 9,600 bit/sec, compared with the 4705 family's previous asynchronous limit of 1,200 to 2,400 bit/sec.

Like its sister system, the 4705E also comes with the recently announced ILS, which reportedly simplifies and trims the cost of switching a group of communications lines from one front end to another.

A purchased 4705E configured with a 1M-byte memory, four channel adapters and 121 interfaces (five of them high speed) costs \$229,000 and can be leased for two years at \$10,270/mo. Deliveries of the machine will begin during the current quarter from Amdahl at 1250 E. Arques Ave., Box 470, Sunnyvale, Calif. 94086.

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What is that soaring so effortlessly up there in the data-processing heavens? Is it a bird? Is it a plane? Is it a man?

Nope, it's a Supersort – SyncSort CMS. And it does for VM/CMS what other versions of SyncSort have done for OS/VS and DOS/VS(E).

A couple of years ago there was no such animal as a high-performance sort program for VM/CMS. As a result, certain kinds of processing were just plain impossible with the system. It's a miracle that VM/CMS survived at all.

Then SyncSort CMS was hatched. It was the first and only sort program designed exclusively for VM/CMS. And it gave leading-edge processors a powerful tool for liberating the potentialities of their system.

In a little over a year, SyncSort CMS has acquired over 350 users. It's growing at a faster rate than either SyncSort OS or DOS were at a similar stage in their development. Here are some of the reasons for that astonishing growth:

1. SOARING PERFORMANCE. SyncSort CMS includes many of the technical breakthroughs we pioneered in OS and DOS sorting – innovations that are now patented.

The best way to find out what this revolutionary new sort program can do for you is simply to try it. You'll be amazed at how little VTime, TTime, Elapsed Time and SIOs it requires. You'll note a sharp drop in response times and a surprising increase in system throughput.

2. FINE-FEATHERED FEATURES. SyncSort CMS liberates programmers. Using the program's full range of features, you can often produce a simple report in one day rather than five. These can do the following:

- Select relevant records;
- Reformat records on output;
- Perform summaries of designated numeric fields;
- Produce reports with pagination, headings, dates.

3. GREATER VERSATILITY. SyncSort CMS is a bird for all seasons:

- It can be invoked from other COBOL, PL/1 or BAL programs.
- It sorts CMS, SAM (OS or DOS) or VSAM files.
- It dynamically allocates space on TDSK.

4. TOP-FLIGHT SERVICE. Ours is the best in sorting. More than 85% of all inquiries are resolved within 24 hours.

If you'd like to realize the full potential of VM/CMS, give us a call, and we'll introduce you to SyncSort CMS. It's a great chance to replace a vulture with an eagle!

Marketing Rights the Issue

Pansophic Sued Over CICS Development Tool

By Bill Laberis

CW Staff

SALT LAKE CITY — Pansophic Systems, Inc. and a small software company have been hit with a multi-million dollar suit filed here last month. The heart of the complaint concerns the marketing rights to an IBM CICS program development tool and allegations charging Pansophic with unfair marketing practices.

The suit, filed by Salt Lake City-based Future Software, Inc. (FS) in district court here, charges Pansophic and SGT Corp. with breach of contract and "other tortuous and contractual violations by the defendants." The nine-count suit asks for up to \$115 million in damages and certain injunctive measures against Pansophic regarding its marketing of the programming tool called SGT, originally developed by SGT Corp.

For some would-be users of the software, the friction between Pansophic and FS has postponed purchase plans, despite numerous user testimonials of SGT's value as a development tool. And for some other users, the intense marketing efforts of both companies and the representations apparently made by each has become a source of confusion that similarly has interfered with purchase plans.

According to one user in Irving, Texas, "SGT is fantastic, a really outstanding product that's like nothing else I've seen on the market. But we have to wait to see the resolution of the dispute before buying. I've heard two entirely different sides ... It seems someone's not telling the truth."

Other users, introduced to the product by the FS sales force, claimed Pansophic tried to dissuade them from buying from FS by using marketing tactics described as "entirely unprofessional" by one user,



David Eskra

CW File Photo

"strong-arm" by another and "Mafia-like" by another.

Last May, SGT Corp. signed an agreement with FS, then called Training Dynamics Corp., giving FS limited exclusive marketing rights to the SGT product. The agreement also reserved marketing rights for SGT Corp., although the suit claims a separate oral agreement between the two mandated that SGT Corp. would not market the product as long as FS attained certain sales quotas.

Unsuccessful Purchase Attempt

Late in 1982, Pansophic tried to buy FS' marketing rights. Pansophic markets a competitor to SGT called MIS/OL. Pansophic's attorney, Martin Greenstein, claimed MIS/OL is not a competitor but a product complementary to SGT. However, several users contacted said they had evaluated SGT against MIS/OL, among other products.

Robert Wall, president of FS, said he refused Pansophic's offer of \$750,000, after which, he claimed, Pansophic "began spreading half-truths, misstatements and outright lies about Future Software and its li-

cense to market SGT." Unable to buy FS' marketing rights, Pansophic bought the SGT product in February and thereby purchased SGT Corp.'s license obligations with FS.

In an interview last week, Wall claimed Pansophic's sales people obtained lists of FS' customers, some of whom had attended an FS seminar in the Dallas area. Pansophic, Wall said, told some of the customers the company would not offer any support or enhancements to FS customers should FS go out of business, while suggesting to others that FS would, in fact, "not last long in the market."

Greenstein, Pansophic's attorney, said Pansophic's marketing people were never given lists of FS' customers by anyone in Pansophic. And regarding Wall's claim that Pansophic threatened users with no support or enhancements of SGT, Greenstein said, "I have no knowledge of any such statements being made."

He said that, although Pansophic's support agreement extends only to FS and not to its customers, Pansophic has made no policy decision regarding SGT support and enhancement offerings in the event FS should go out of business.

But several users contacted last week regarding the marketing of SGT by Pansophic and FS offered their own version of the sales approaches used by the two companies. Herb Finmark and Joseph Schiebly, DP professionals at Aero Spatiale Helicopter Co. in Grand Prairie, Texas, bought SGT from FS in January for \$25,000. Prior to the purchase, the two said they were contacted by Pansophic sales people, who offered a smaller SGT package for \$35,000.

Asked what bargaining chips Pansophic presented, Finmark said he was told FS "probably wouldn't be able to stay in business." The Pansophic marketers also said Pansophic "would not support any customer

base which has bought the product from FS," Finmark said.

Finmark said he also received a phone call "from the president of Pansophic, who told me I would be up the creek without a paddle should FS go away."

'No Suit Filed'

Contacted last week, David Eskra, Pansophic president, first denied a suit had been filed, saying, "There has been no suit filed against Pansophic or against SGT Corp. in any court in any land." In fact, the suit had been filed a month earlier, and notice of it had been served to Pansophic March 29. Eskra referred further inquiries to company lawyer Greenstein, who said all questions regarding the suit would be answered by his office.

Paul Pitrak, a DPer at Interstate National Corp. in Chicago, said he called FS to inquire about the product. After an initial contact with FS, Pitrak said he was "immediately contacted by Pansophic," which offered him the SGT package for \$5,000 more than FS had.

"Their approach was pretty nasty," Pitrak said of the Pansophic marketing effort. Pitrak said he was told by Pansophic that should he purchase SGT from FS, "there would be absolutely no support, no information on new releases" should FS "run into problems." He said Pansophic said further that FS "had to sell 10 (SGT) packages the first year and 100 the next or they would be out of business."

Support Questioned

"They made lots of heavy implications," Pitrak said. He was later told by the Interstate National legal department that, if the DP department wanted SGT, it would have to buy it from Pansophic "because the legal guys were concerned about future support after hearing from Pansophic."

Weymund Dunn, DP director at Pride Refining in Abilene, Texas, characterized Pansophic's sales approach "as pretty dishonest, in my opinion."

Dunn, who said he will probably lease or buy SGT from FS, said Pansophic contacted him "relatively soon after my contact with FS." Dunn said he was told Pansophic "was just about to purchase the SGT product, when in fact they had not."

A DPer who arranged to buy SGT for the Dow Chemical Co. Houston office said he chose Pansophic over FS, even though FS introduced him to the product. FS, he said, "is a one-product company that I did not believe could provide the worldwide support we need."

Jim Thomas, DP director at Waco Central Freight Lines in Waco, Texas, said he was contacted by Pansophic shortly after his initial contact with FS. Pansophic told him "not to purchase SGT from FS, but to wait two or three weeks for a better deal from them." Asked if he felt threatened by Pansophic's sales force, Thomas said, "No, but I have certainly felt pressure not to buy from FS ... I thought this was very unprofessional."

Congressmen Back Software Tax Credit

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Thirty-seven members of Congress have sided with the DP industry in its fight against a Treasury Department proposal to deny recently instituted tax credits for most software research and development.

In a letter to Treasury Secretary Donald T. Regan, the legislators said Internal Revenue Service denial of the tax credits would be "contrary to the intent of Congress" when it included provisions in the 1981 Economic Recovery Tax Act designed to increase American R&D.

The proposed regulation, issued Jan. 21, would make the tax credit not applicable "for the development of software, the operational feasibility of which is not seriously in doubt." By this provision, the IRS sought to exclude the credit for modifying existing software for new end uses and allowing it only for completely new or experimental programs.

The proposal was immediately attacked by DP industry representa-

tives here, particularly the Computer and Business Equipment Manufacturers Association (Cbema) and the Association of Data Processing Service Organizations, Inc. (Adapso), who have lobbied long and hard against the proposed IRS regulation. The controversy will come to a head tomorrow when the IRS holds a hearing on its proposal; both Cbema and Adapso plan to testify.

Cbema President Vico Henriques recently complained that IRS reasoning "completely ignores Congress' clear concentration on the end product of software development and focuses instead on the method by which the software is produced."

Noting the IRS language to deny the tax credit to software development based on "standard or well-known programming techniques," Henriques interpreted the proposal to mean "a software product developed through use of an established programming language like Cobol would not be eligible for a tax credit, no matter how novel, sweeping or innovative that product was."

It is difficult to imagine," he said,

"that the IRS is trying to encourage American businesses to gamble on unfeasible projects." According to Henriques, "Congress intended to provide a credit for all R&D activity underlying the introduction of new or significantly improved products to the marketplace."

The 37 members of Congress who signed the letter to Regan agreed with that position, saying the IRS proposed regulation is too narrow and "does not accurately reflect the intent of Congress in enacting the credit and would prevent the credit from fully serving the purpose for which it was created."

The letter further argued the proposal "does not adequately allow for the product evolution and modifications that are necessary to maintain competitiveness in many technological fields." Those sections of the proposal affecting software, they said, "seem almost completely to preclude the eligibility of software development costs, contrary to the intent of Congress that there be a general presumption in favor of the applicability of the tax credit to software."

IBM Casts Pall Over Settlement of Hitachi Case

By Jeffry Beeler

CW West Coast Bureau

SAN FRANCISCO — IBM last week expressed serious doubts that its civil suit against Hitachi Ltd. and two of its U.S. business partners could be settled out of court.

FM Net Service To Start in July

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — A low-cost data transmission service, based on use of FM subcarrier channels, is scheduled to begin commercial operation here in July. It is expected to be a national network by the first quarter of 1984, according to Martin Clark, marketing vice-president of National Information Utilities Corp. (NIU), which developed the system.

The service will cost a minimum of \$25/mo per terminal. The price covers an addressable receiver and the right to transmit up to 20,000 characters to any number of receiving stations. It will be offered by INC Telecommunications, a joint venture of NIU and National Public Radio (NPR), both headquartered in the Washington area.

The FM subcarrier channel that will connect the INC network to receiving stations has a maximum transmission rate of 9.6K bit/sec, Clark said. In most areas, channels will be provided by stations affiliated with the NPR network; elsewhere, commercial FM stations will be used. Leased satellite channels will provide intercity links.

"In most cases, our customer will be a company with multiple remote branches — a supermarket chain, for example," Clark explained. Initially, information will be transmitted from the customer's site — typically, company headquarters — to our central switch in McLean, Va., over channels leased from a value-added carrier such as GTE Telenet, Inc. or Tymnet, Inc. Later, we plan to shorten this link by receiving the customer's input at any of 18 satellite up-links owned by NPR. In either case, however, when the information reaches our switch it will be routed back through the network to the public radio station nearest the receiving terminal; the final link in the message path will be the subcarrier channel."

Clark expects electronic mail to be a major application of the network. Another application would involve remote control that would allow public utilities to turn customers' heating, air conditioning and similar appliances on and off at specified times.

Until this month, FM subcarrier channels, officially called Subsidiary Communications Authorization (SCA), could be used only for broadcast applications. But the Federal Communications Commission removed the SCA limitations a few weeks ago and widened the FM band from 75 to 99 kHz. As a result, public and commercial FM radio stations now have a second subcarrier channel and can provide or support non-broadcast applications like the one INC is planning.

In an April 12 status conference in U.S. District Court here, IBM attorney Thomas Barr informed Judge Spencer Williams that prolonged efforts by the two sides to resolve the case have failed to produce an agreement.

On Feb. 10, a federal court gave IBM and the Hitachi group 60 days to discuss their differences and try to reach an out-of-court settlement.

But despite good-faith negotiating on both sides, "the discussions have gone nowhere," according to Barr, whose remarks raised the distinct possibility that the case would have to go to trial.

The IBM attorney then indicated his client's willingness to begin presenting its arguments in court as ear-

ly as Nov. 1 and asked Williams to set a trial date.

Williams, in turn, rejected IBM's suggested trial date as too early and proposed January or February of 1984 as a more realistic starting time, if an out-of-court settlement proves impossible.

Sharp Contrast

Barr's gloomy assessment of the recent legal haggling contrasted sharply with the views expressed by Hitachi's lead attorney Peter Fleming, who voiced confidence that a trial might still be averted.

Fleming urged representatives of both IBM and Hitachi to meet in New York on May 2 to continue their discussions and "determine which

side is right" on the question of whether an out-of-court settlement is impossible.

Both Fleming's and Barr's remarks came during an hour-long courtroom conference.

The conference was prompted by a civil suit that the industry giant filed last year following the disclosure of a Hitachi conspiracy to transport stolen IBM trade secrets from the U.S. to Japan. Defendants in the suit include National Semiconductor Corp. and National Advanced Systems, Inc., as well as Hitachi.

Paralleling the civil action are several separate criminal cases, one of which ended in February when Hitachi pleaded guilty to one count of conspiring to transport stolen goods.

In this business a company lives to enjoy old age by keeping one principle alive. Staying new.

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April 4-8 Long Beach
April 18-22 Chicago
May 23-27 Boston
June 13-17 San Francisco

DATABASE ADMINISTRATORS WORKSHOP (5 Days)

April 25-29 New York
May 16-20 London
INTERNAL CONTROLS & DATA
SECURITY WORKSHOP
(3 Days)

May 23-25 New York

AUDITING STRUCTURED ANALYSIS & DESIGN WORKSHOP (5 Days)

June 6-10 New York

STRUCTURED PROGRAMMING WORKSHOP IN PASCAL (5 Days)

May 9-13 Anaheim

INTRODUCTION TO THE TOOLS OF STRUCTURED ANALYSIS (2 Days)

May 10-11 New York

STRUCTURED ANALYSIS & SYSTEM SPECIFICATION WORKSHOP (5 Days)

April 4-8 Boston
April 11-15 Columbus
April 11-15 New York
April 11-15 Salt Lake City
April 18-22 London
April 18-22 Chicago
April 25-29 Houston
May 2-6 Calgary
May 2-6 Ottawa
May 9-13 Denver
May 9-13 Oklahoma City
May 16-20 Amsterdam
May 16-20 Washington, DC
May 16-20 San Francisco
May 23-27 Milwaukee
May 23-27 Birmingham,
England
June 6-10 Atlanta
June 6-10 Regina
June 6-10 Phoenix
June 13-17 Copenhagen
June 13-17 London
June 13-17 Portland
June 20-24 Los Angeles
June 20-24 Miami
June 20-24 New York

STRUCTURED ANALYSIS FOR REAL TIME SYSTEMS (5 Days)

April 11-15 Minneapolis
May 9-13 Boston
June 6-10 Long Beach
STRUCTURED ANALYSIS FOR
USERS (3 Days)

April 12-14 Washington, DC

April 18-20 Miami

April 25-27 Toronto

May 2-4 Anaheim

May 9-11 New York

May 16-18 Ottawa

June 6-8 London

June 13-15 Chicago

June 20-22 Boston

ADVANCED STRUCTURED ANALYSIS (5 Days)

April 4-8 Ottawa

April 11-15 Amsterdam

April 11-15 New York

April 18-22 Anaheim

May 2-6 Houston

May 9-13 Washington, DC

May 9-13 Salt Lake City

May 16-20 London

June 6-10 Boston

June 13-17 Chicago

June 20-24 San Francisco

June 20-24 Toronto

INTRODUCTION TO THE TOOLS OF STRUCTURED DESIGN (2 Days)

June 6-7 New York

STRUCTURED DESIGN WORKSHOP (5 Days)

April 4-8 Phoenix

April 11-15 New York

April 18-22 Los Angeles

April 18-22 Ottawa

April 25-29 Copenhagen

April 25-29 London

May 2-6 Chicago

May 2-6 Toronto

May 9-13 Atlanta

May 9-13 Seattle

May 16-20 Boston

May 16-20 Edmonton

June 6-10 Washington, DC

June 6-10 Winnipeg

June 13-17 Cleveland

June 13-17 San Francisco

June 13-17 Salt Lake City

June 20-24 London

June 20-24 New York

STRUCTURED QUALITY ASSESSMENT WORKSHOP (2 Days)

April 27-28 New York

May 16-17 Washington, DC

June 6-7 San Francisco

June 9-10 London

STRUCTURED PROGRAMMING WORKSHOP IN COBOL (5 Days)

April 4-8 Chicago

April 18-22 Boston

May 23-27 San Francisco

June 13-17 New York

SYSTEMATIC SOFTWARE TESTING (2 Days)

April 18-19 New York

April 25-26 Los Angeles

May 9-10 Chicago

May 16-17 Houston

June 13-14 San Francisco

June 20-21 Boston

INFORMATION MODELING WORKSHOP (5 Days)

April 11-15 Toronto

April 18-22 New York

April 25-29 Ottawa

May 2-6 Atlanta

May 16-20 Boston

May 16-20 San Francisco

May 23-27 London

June 13-17 Anaheim

June 13-17 Washington, DC

June 20-24 Chicago

June 20-24 Houston

MANAGING PROJECTS IN THE STRUCTURED ENVIRONMENT (2 Days)

April 4-5 Washington

April 18-19 Boston

May 9-10 San Francisco

May 16-17 New York

June 6-7 Atlanta

June 13-14 Houston

June 20-21 Anaheim

PROJECT PLANNING & CONTROL WORKSHOP (5 Days)

April 11-15 New York

April 18-22 Chicago

May 9-13 Boston

June 6-10 Phoenix

June 13-17 Houston

June 20-24 San Francisco

STRATEGIES FOR SOFTWARE DEVELOPMENT (3 Days)

April 18-20 London

May 11-13 San Francisco

MANAGING THE MAINTENANCE EFFORT (2 Days)

April 4-5 New York

April 28-29 London

May 11-12 Chicago

May 16-17 Toronto

June 6-7 Anaheim

June 13-14 Boston

PROJECT & TEAM MANAGEMENT WORKSHOP (3 Days)

April 18-20 New York

April 25-27 London

April 25-27 San Francisco

May 2-4 Toronto

May 9-11 Anaheim

May 16-18 Washington, DC

June 6-8 Chicago

June 13-15 Houston

June 20-22 Boston

FINANCIAL MODELING—A STRUCTURED APPROACH (5 Days)

April 11-15 Washington, DC

May 16-20 New York

June 20-24 Cleveland

STRUCTURED DESIGN & PROGRAMMING WORKSHOP FOR MICROPROCESSORS (5 Days)

April 4-8 Boston

May 16-20 San Jose

June 13-17 Anaheim

MGT. IMPLICATIONS OF STRUCTURED TECHNIQUES FOR MICROPROCESSORS (2 Days)

April 4-5 Anaheim

ADA SOFTWARE ENGINEERING WORKSHOP (5 Days)

April 4-8 San Jose

April 11-15 Washington, DC

June 20-24 San Jose

June 27-01 Washington, DC

STRUCTURED ANALYSIS & SYSTEM SPECIFICATION WORKSHOP FOR MICROPROCESSORS (5 Days)

May 2-6 Anaheim

June 6-10 Boston

STRUCTURED SYSTEMS DEVELOPMENT (1 Day)

April 11 Atlanta

April 22 Washington

May 16 Boston

May 23 Kansas City, MO

June 13 Toronto

June 20 New York

STRUCTURED DESIGN & PROGRAMMING WORKSHOP (5 Days)

April 4-8 Chicago

April 18-22 Amsterdam

April 18-22 New York

May 9-13 London

May 16-20 San Francisco

May 23-27 Boston

June 6-10 Washington, DC

June 13-17 Denver

June 13-17 Toronto

STRUCTURED PROGRAMMING WORKSHOP (5 Days)

April 4-8 Houston

April 18-22 Toronto

May 2-6 San Francisco

May 23-27 Boston

June 6-10 New York

June 20-24 Anaheim

STRUCTURED PROGRAMMING IN COBOL (2 Days)

April 13-14 Washington, DC

June 20-21 San Francisco

STRUCTURED ANALYSIS & DESIGN WORKSHOP (5 Days)

April 4-8 New York

April 4-8 Minneapolis

April 11-15 Calgary

April 18-22 Denver

April 25-29 Washington, DC

May 2-6 Boston

May 2-6 Atlanta

May 2-6 Salt Lake City

May 9-13 Chicago

May 9-13 Toronto

May 16-20 Copenhagen

May 16-20 London

May 16-20 San Antonio

May 23-27 San Francisco

June 6-10 Houston

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June 20-24 Portland

June 20-24 Regina

June 27-01 Anaheim

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Visicorp, Informatics Tie IBM Micros, CPUs

(Continued from Page 1)

This component provides centralized control over access to the data base, according to Merritt M. Lutz, software products group vice-president at Informatics. Centralized DP and the data base administrators install Answer/DB and set up user profiles that control access to various files in the data bases down to the field level, he explained.

The initial version of Answer/DB and Visianswer will communicate with each other using a proprietary asynchronous link protocol, the vendors said. Later versions will incorporate support for IBM's bisynchronous Systems Network Architecture/Synchronous Data Link Control communications protocol, according to both vendors.

Lutz described the linking software as a "personal information center" because access to the mainframe

data base is transparent to the end user and available on an ad hoc basis; centralized DP controls access to the

data base; and the facility is a "universal extractor" that can provide access to any data base and any applica-

tion data on an IBM mainframe.

Daniel H. Fylstra, chairman of Visicorp, anticipated that the linking software would provide "acceptable responsiveness to [Personal Computer] users at the same time as easing the load on the mainframe." He explained that the user's formulation of his query on the Personal Computer is handled off-line. "Only when the query is ready does he go on-line. Then the query can be executed immediately or can be queued for execution."

First customer shipments of Visianswer in the U.S. are expected to begin in the third quarter of 1983. The U.S. purchase price of a typical configuration of the linking software, consisting of an Answer/DB module on a single mainframe and Visianswer for 50 personal computers, will be \$45,000. Answer/DB as a stand-alone package is priced between \$25,000 and \$35,000. Both vendors will be marketing the products.

Further information is available from Visicorp, which is located at 2895 Zanker Road, San Jose, Calif. 95134 or from Informatics at 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

Package Ties IBM Micro To M&D Bases

(Continued from Page 1)

Data is summarized at the mainframe level according to predefined formats. The ad hoc query capability on the microcomputer level allows the user to specify row and columnar formats for the data to be downloaded.

Data can be manipulated under Lotus 1-2-3 and then uploaded to the mainframe on-line. Security is provided at field and record levels on downloading, according to John Landry, vice-president of research and development.

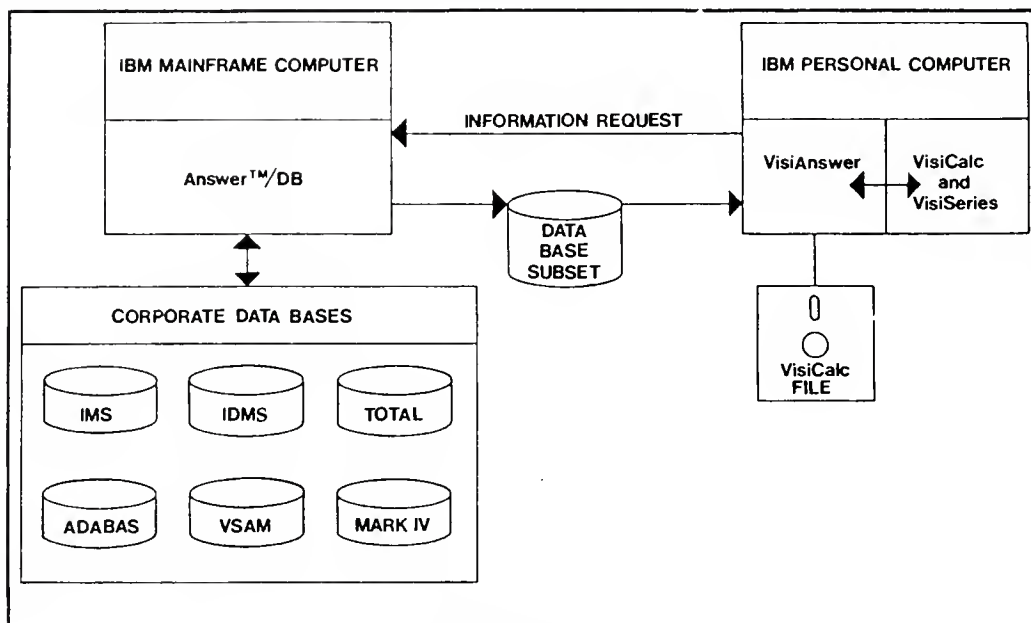
Under the Interactive PC Link, the IBM Personal Computer can act as a microcomputer, a 3270 terminal or both, he explained. Users log on to the system through Hilite, and the emulator can then be made resident. Users can switch between the modes by using double-shift keys, he maintained.

McCormack & Dodge will supply customized micro- and mainframe-based software to provide the capability to develop budgets on Lotus 1-2-3 and then upload the data to the mainframe files. McCormack & Dodge will also provide customized graphics software that allows the user to employ Lotus 1-2-3 graphics capabilities to display mainframe data.

Interactive PC Link will be available in the third quarter for IBM OS and DOS operating environments with CICS.

Pricing is set at \$25,000 per mainframe CPU, with an additional charge of \$2,500 per IBM Personal Computer. Pricing includes Lotus 1-2-3 and interfaces.

McCormack & Dodge is located at 560 Hillside Ave., Needham Heights, Mass. 02149.



Micro-to-Mainframe Interaction

Different Roads Taken to Mainframe Link

By Lois Paul
And Paul Gillin
CW Staff

Developers of software links between micros and mainframes are taking slightly different approaches to this much-sought-after technology, as evidenced by the two recent announcements highlighted here.

The linking software developed by McCormack & Dodge Corp. and the combined offering from Infor-

Analysis

matics General Corp. and Visicorp share certain features. Both provide a capability to download a subset of an IBM mainframe data base file to an IBM Personal Computer.

However, Informatics' offering was designed to be application-independent, providing access to a vari-

ety of mainframe files and data bases, including IBM's IMS and DL/1 and files accessed by Vsam, Isam and other standard IBM access methods.

McCormack & Dodge has chosen to restrict the product to users of its Advanced Financial Systems financial software and Hilite query system and is requiring customers to buy the Lotus Development Corp. 1-2-3 spreadsheet financial analysis package.

The first application of its micro-mainframe link will be with the company's G/L Plus system.

Both Informatics and McCormack & Dodge have aligned themselves with microcomputer software firms. Each firm's linking package enables users to manipulate the downloaded data with microcomputer-oriented packages.

Enables Access Control

Each micro-mainframe link enables the centralized DP department to maintain control over access to the mainframe data base files. With the Informatics product, this control is provided via the firm's Answer/DB package.

With McCormack & Dodge's offering, it is part of the internal security controls of the financial software packages.

A significant difference between the two software links is that the initial version of Visianswer and Answer/DB will not enable users to upload data to the mainframe. The McCormack & Dodge product supports real-time uploading of files for updating the mainframe data base. In addition, this product includes the hardware/software communications interfaces, whereas Informatics and Visicorp are not bundling any hardware with their product.

The McCormack & Dodge offering also carries a considerably higher price tag than the price tag on the Informatics link.

A configuration of 50 microcomputers, for example, would cost \$150,000 (\$25,000 per mainframe CPU plus \$2,500 per IBM Personal Computer), compared with \$45,000 for a 50-machine configuration under the Informatics product.

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Don't Ignore Megasystems, He Warns

Yourdon Raises Red Flag on Micro Captivation

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — The DP community must not let its growing fascination with microcomputers divert its attention from the technical and social issues relating to large systems, consultant, author and lecturer Edward Yourdon told the Federal DP Expo last week.

Delivering the annual show's keynote address here last Tuesday, Yourdon, chairman of the board of Yourdon, Inc., said, "Society is now living with more and more complex systems," which he refers to as "megasystems." That term, he said, could be applied to any large industry or organization, such as the computer industry, the U.S. telephone system and just about every federal agency.

There is increasingly a dangerous, runaway quality to these megasystems, he said, primarily because they are too often managed "by people who think they can change things or control things, and they really can't."

"We are building megasystems that are so large and complex that we hardly understand them," according to Yourdon, who said, "mistakes and misjudgments in these systems are growing more and more severe."

Yourdon said systems people need to have more influence on the development and management of these megasystems. "Computers and computer people ought to be playing a major role here," he said, because "computers are a recurring component of most megasystems."

The role of the systems person in megasystems should be to develop better analytical and modeling techniques for their development, according to Yourdon, who nevertheless noted that the computer industry has never been known for accurately predicting the evolution of technology. Taking a stab at it himself, Yourdon offered his audi-

ence a number of "silly predictions," including:

- The shortage of programmers will disappear in the next few years. U.S. schools "are turning out massive numbers of trainees," he said, including 50,000 computer science graduates every year. Also, such advances as information centers and programmer productivity tools will help the growing number of programmers reduce today's project backlogs.

- Related to the first prediction, Yourdon said, is the fact that software development will become a more labor-intensive activity, and like other "dirty, messy, unsatisfy-

ing" occupations, it will migrate to the Third World. "There really is nothing magic about writing Cobol statements ... anyone can do it," he said, noting that China and Singapore are already trying "to get into the [software] body shop business."

- Micros will dominate mainframes. While this is "not a terribly novel prediction," Yourdon admitted, he suggested many of the consequences of this development have not been appreciated. "It's going to cause a major sociological shift."

- Hardware will get cheaper and faster. Yourdon offered some new implications of this long-time trend, including the possibility of dispos-

able computers within 20 years.

- DP empires will disappear and computing will become a utility. Yourdon suggested that today's DP department jobs will become as obsolete and unappealing as automobile assembly line work.

- Telecommuting will become widespread. "The computer industry is obviously the vanguard" of the development of high-tech cottage industries, he noted.

- The "battle with Japan" will not be over hardware or software — "because we have already lost both of these" — but, according to Yourdon, it will be in the production of information.



Guide to Cover Communications

DETROIT — Gale Research Co. has announced that it will publish in June the first edition of the "Telecommunications Systems and Services Directory," providing detailed descriptions and full contact information on the rapidly growing number of communications systems that transmit data, voice, text and images.

Among the services that will be covered are voice and data communications networks, teleconferencing, videotex and teletext.

The directory reportedly will include over 1,000 entries in three soft-bound issues. Cumulative in each issue will be four indexes: Master Index, Personnel Index, Geographic Index and Function/Service Type Index. A glossary of technical terms will also be included.

A three-issue subscription, beginning in June, costs \$150. Remaining issues will be published at three- to six-month intervals.

More information is available from Gale Research, Book Tower, Detroit, Mich. 48226.

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Textbook Dispute Snags DPMA Curriculum

By Jeffry Beeler

CW West Coast Bureau

Controversy is brewing within the Data Processing Management Association (DPMA) over the question of whether the organization has acted properly in selecting textbooks for the DPMA's model curriculum.

Several prominent DPMA members are questioning the "appropriateness" of what one member terms a "sweetheart deal" between the association and Cincinnati-based South-Western Publishing Co., a major textbook supplier.

Under the arrangement, DPMA plans to create a three-member review panel to evaluate the suitability of South-Western's textbooks for use in the nationwide model curriculum. If the books are found to satisfy the curriculum's minimum academic requirements, the association will give the materials its formal stamp of approval.

In return for the endorsement, South-Western has agreed to pay the DPMA's Education Foundation an undisclosed sum of royalties, according to Terence Boyer, president of the foundation's Board of Regents.

Although the royalties are earmarked for projects that are widely regarded as worthwhile, at least a few DPMA members still find the association's relationship with South-Western deeply troubling.

Typical of some of the critics is Dr. Robert Zant, chairman of North Texas State University's Business Com-

puter Information Systems Department. Zant sees a glaring inconsistency between the DPMA's status as a nonprofit organization and its involvement in a nakedly commercial venture.

"I personally don't think it's proper for the association to enter into a commercial arrangement and profit from a curriculum that it's trying to promote from a purely academic viewpoint," Zant said.

Zant and others have also voiced serious misgivings about the role of the regents themselves in administering the agreement between DPMA and South-Western. At least two of the textbooks that have received the Education Foundation's blessing for use in the model curriculum were written by individuals who are also currently serving on the Board of Regents.

No one who has criticized the DPMA's arrangement with South-Western has gone so far as to suggest that the regents were motivated to enter the agreement by a desire for personal gain. In fact, a few critics of the publishing arrangement have asserted just the opposite.

"I'm sure the people who are responsible for this agreement are convinced they're doing the right thing," according to Dr. Tom Ho, chairman of Purdue University's computer technology department. "They just want the model curriculum to succeed so badly that they're doing everything they can to ensure

its success," he said.

But although critics dismiss suggestions that the regents are using the agreement for their own benefit, they still express concern that the relationship between DPMA and South-Western has created at least the appearance of a conflict of interest.

Even an illusion of misconduct on the part of the regents could stain the model curriculum's reputation and erode its credibility, according to Dr. William Cornette, chairman of Southwest Missouri State University's Information Systems Management Department.

Boyer, however, dismisses such

concerns as groundless, and to support his position, he points to the existence of the textbook-review committee, which reportedly operates independently of both the regents and South-Western. The committee, which already includes one member and will soon be expanded with two additional reviewers, was formed precisely for the purpose of protecting the regents from possible conflict-of-interest charges, he said.

Boyer also defended the publishing arrangement on the grounds that it does not expose the regents to financial temptations that are not routinely encountered in the academic world.

Publication of Textbook Inflames Contract Debate

By Jeffry Beeler

CW West Coast Bureau

Debate over the propriety of a contract between South-Western Publishing Co. and the Data Processing Management Association (DPMA) intensified earlier this year with the publication of the first officially endorsed textbook for DPMA's model curriculum.

Titled *Computer Information Systems (CIS): An Introduction*, the book was coauthored by Terence Boyer, president of the DPMA Education Foundation's Board of Regents, and two of his association colleagues. CIS I is destined to find its way into a model curriculum that aims to provide universities with uniform guidelines for teaching undergraduates to become entry-level business applications programmers and analysts.

The idea for the curriculum, which proposes a broad academic framework consisting of seven "core" and eight elective courses, originated at California State Polytechnic University in 1979. Later, responsibility for developing the model was transferred to the Education Foundation. After undergoing a lengthy process of reviews and revisions, the curriculum was formally adopted by the foundation in May 1981.

Search for Texts

In November of that same year, South-Western approached the Education Foundation with an offer to supply the model curriculum with a complete series of 15 textbooks collectively titled "Computer Information Systems."

Convinced that the search for qualified texts needed some "pump priming," the foundation accepted the offer and decided to use the resulting royalties to "retool" the U.S.'s information systems faculty to teach the model curriculum, Boyer said.

In theory, nothing in the contract with South-Western forbids the Education Foundation from endorsing or soliciting qualified textbooks from other publishers. But at least in the case of CIS I, the only textbook that the foundation considered for use in the model curriculum was the volume coauthored by Boyer.

Although Boyer cited deficiencies

in competing textbooks as the reason for the foundation's omission, many of his DPMA colleagues found the explanation less than completely satisfying.

On March 21, at a DPMA-sponsored Information Systems Education Conference in Chicago, a group of 60 attendees voted unanimously to disapprove of the Education Foundation's contract agreement with South-Western. The vote was non-binding, according to Dr. Jim Wetherbe, a management information systems professor at the University of Minnesota's School of Management.

Opposition to the agreement with South-Western also eventually prompted Wetherbe to resign from his post on the Education Foundation's Curriculum Committee, which is charged with keeping the model curriculum technically up to date.

'Yellow Pages' Out for Software

FAIRFAX, Va. — PC Telemart, Inc. has announced publication of the "PC Clearinghouse Software Directory," which lists more than 21,000 software packages and identifies 2,912 software publishers and 200 microcomputer manufacturers.

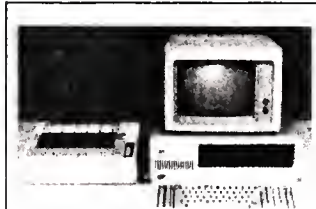
Subtitled the "yellow pages to the world of microcomputers," the 840-page directory also includes cross-references to hardware, operating systems, applications packages, programming languages and prices, a spokesman said.

Besides names and addresses of software and hardware vendors, the directory tells which software packages fit specific needs, which software packages can be used with certain hardware and which operating systems run on specific microcomputers.

The directory is available nationally in Waldenbooks bookstores, Computerland stores, Sears Business Systems Centers and other independent computer stores and bookstores, the spokesman said.

The cost per directory is \$29.95. The directory can also be ordered through PC Clearinghouse, Inc., 11781 Lee Jackson Highway, Fairfax, Va. 22033.

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The management of *Ultra* Magnetix then hired all the top brains in the diskette industry to make the *Ultra* product. Then these top bananas (sometimes called floppy freaks) created a new standard of diskette quality and reliability. To learn the "manufacturing secrets" of the top diskette makers, they've also hired the remaining "magnetic media moguls" from competitors such as Verbatim, Memorex, Dysan and many more. Then all these top-dollar engineers, physicists, research scientists and production experts (if they've missed you, send in your resume to *Ultra*) were given one directive...to pool all their manufacturing know-how and create a new, better diskette.

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- 3. SPECIALLY LUBRICATED DISK** - *Ultra* uses a special oxide lubricant which is added to the base media in the production of their diskettes. This gives you a better disk drive head to media contact and longer head and disk life.
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8" DSDD Soft Sector (1024 B/S, 8 Sectors)	82708	3.19
5 1/4" SSDD Soft Sector w/Hub Ring	50001	1.79
5 1/4" Same as above, but bulk pack w/o envelope	00153	1.39
5 1/4" SSDD 10 Hard Sector w/Hub Ring	50010	1.79
5 1/4" SSDD 16 Hard Sector w/Hub Ring	50016	1.79
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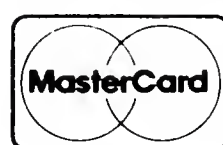
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Knowledge Workers/Systems Staff Division

DP Managers Urged to Bridge 'Culture Gap'

By Ed Scannell
CW Staff

PHILADELPHIA — DP managers must bridge a "culture gap" between their departments and office-oriented knowledge workers in order to realize potential productivity and cost benefits of office automation.

That is the message Booz-Allen & Hamilton, Inc. Vice-President Gerald Tellefsen delivered here last week in an Executive Briefing at the National Micrographics Association annual show.

Kicking off the week-long conference and equipment exposition, Tellefsen cited the DP manager's failure to integrate properly information retrieval systems into the mainframe environment and his inability to speak plain English as two of the reasons why there is not an "homogeneous culture" within most large organizations today.

Pointing out the DP manager's preference for computerese, Tellefsen said, "Most DP managers don't speak English. This is one of the reasons there is a culture gap between knowledge workers and systems staffs — they don't speak the same language."

The other factor that keeps many office automation applications from progressing beyond their infancy, according to Tellefsen, is the DP manager's failure to examine the benefits of information retrieval systems.

"The DP manager is ignorant of information retrieval systems, yet information retrieval can be the most productive technology he has," Tellefsen contended.

In order to make office automation work, the DP manager has to take a "horizontal" approach to the situation, Tellefsen maintained. "They [DP managers] can't market, train or sell — they are always thinking vertically, not horizontally. They have to be able to show what the benefits are to the accountant

and what they are to the clerical worker," he said.

The culture gap between the DP manager and the knowledge worker is only one of several that are weighing down the potential of office automation, according to Tellefsen. Culture gaps between manufacturers/service bureaus and technology buyers, user management and nonmanagement staffs and different categories of technologists are equally important antagonists, he noted.

Other inhibitors, as Tellefsen describes them, to office automation

CW
at NMA

taking place today include the high entry costs (ranging between \$200,000 and \$300,000),

no method of clearly evaluating the benefits, the lack of top management support, reticent knowledge workers and no precedents to serve as guideposts.

Fueling these culture gaps are two syndromes he labeled the solution-looking-for-a-problem syndrome and the tail-wagging-the-dog syndrome. "Or put another way, technology shouldn't be driving office automation; the knowledge worker

should be driving office automation," he explained.

With U.S. corporations investing over \$1 trillion a year on their office-based knowledge workers, Tellefsen said convincing skeptical knowledge workers that automation can help them is crucial. But the only way that can be accomplished is if top management comes down from its ivory tower and takes an active part in the proceedings.

"Top management has to educate its workers and they can't do it from the 33rd floor," Tellefsen remarked.

Tellefsen said statistics show knowledge workers "waste" 25% of their work day.

NO PURCHASE

Two Brochures Out From NMA

SILVER SPRING, Md. — The National Micrographics Association's (NMA) Resource Center has released two special interest packages: "Information Processing from the Manager's Viewpoint" and "Trends in Optical and Video Disks."

"Information Processing from the Manager's Viewpoint" includes discussions of changes in the information processing industry, economics of an information processing system and the compatibility of information storage systems with future technologies.

"Trends in Optical and Video Disks" contains articles on storage capacities of magnetic media, the relationship between micrographics and optical data disks and trends in on-line information retrieval.

The packages cost \$20 each for non-NMA members and \$15 for NMA members, a spokeswoman said from 8719 Colesville Road, Silver Spring, Md. 20910.

Optical Disk Postponed, Some Vendors Relieved

By Ed Scannell
CW Staff

PHILADELPHIA — With both Eastman Kodak Co. and 3M Co. announcing at last week's National Micrographics Association (NMA)

show here that neither will offer optical disks on a commercial basis in the foreseeable future, it seems the fortunes of high-end microfilm and microfiche suppliers are safe for now.

The demonstration by 3M of the first workable direct read-after-write optical disk system — manufactured by Toshiba Corp. — at last year's

NMA show and speculation that Kodak and RCA Corp. were about to unwrap similar products a year ago prompted some industry watchers to believe the days of microfilm and microfiche suppliers were numbered.

However, citing the networking limitations of the optical devices developed by both Toshiba and Kodak, 3M announced that it plans to introduce an intermediate product that will precede its optical disk-based system. Based on this announcement, several microfiche exhibitors argued that the demand for their products in both low- and high-volume applica-

CW at
NMA



CW Photo by E. Scannell

Mnemos, Inc.'s Gary Irving displays the unbreakable Mnemodisk.

tions will remain solid for at least the next five years.

"While its true that this [optical

disk] technology is being developed by a number of companies, including Kodak, it may be more realistic to expect an intermediate system to bridge today's microfilm systems to optical disk," John A. Lacy, national sales manager for Kodak's Business Systems Markets Division, said.

Lacy said the bridge system would be capable of electronically transmitting microfilm images. He said such a system would provide users with the ability to transmit microfilm images to distant locations as well make a central microfilm file accessible to remote users through a network that would connect an organization's departments at one location or at remote locations. He added that such a system would also integrate images and alphanumeric information for simultaneous display.

Lacy said the company's optical disk, which has been in development for the last 10 years, can record digital information at 24M bit/sec and can store up to 5,600M bytes of information.

"In other words if the average paper document contains about 4 million bits of information, our disk can hold more than 100,000 pages when digital compression ratios of 10:1 are employed," Lacy said.

The disk's image recording surface has three layers with the first layer recording the information, the second reflecting light to aid in the recording and reading of information and the bottom layer supplying the surface for recording.

Like the microimage transmission system no timetable has been set up for the commercial availability of the disk.

3M's plans of marketing Toshiba's optical disk system soured because of the machine's networking limitations and the limitations of existing local-area networks themselves.

"For the product to be marketable it has to be spread out all over the company. But Toshiba's product is stand-alone and as such it is not marketable," explained Kyler Nelson, systems manager of electronic file management for 3M's Micrographic Products Division.

In describing the limitations imposed by current local-area networks Nelson said, "local networking can't support a resolution of a system like Toshiba's. You need separate architectures and communications protocols."

The only optical disk-based system being demonstrated at the show was Matsushita Electric Industrial Co.'s system which was introduced in New York last week [See Page 77].

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Datacomm Briefs

BOC Gets OK to Sell Gear Directly to DOD

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — Bell operating companies (BOC) have been granted permission by the Federal Communications Commission (FCC) to sell terminal equipment directly to the Department of Defense and federal civil emergency agencies. The decision may foreshadow how the commission will act on the question of whether Bell operating companies must form separate subsidiaries to offer products and services that compete with nonregulated suppliers.

This is a key question for users as well as vendors. Spokesmen for both groups insist that if the Bell operating companies are allowed to offer terminals and enhanced services directly, they will scare off new competitors and reduce the market of those already in the business.

The same sources have also suggested that the Bell operating companies are stalking horses for AT&T's Long Lines Division. Under the FCC's Second Computer Inquiry Decision, AT&T can market terminals and enhanced services only through a separate subsidiary, for example, American Bell, Inc.

Bell operating companies are also barred by the Second Computer Inquiry Decision from marketing terminals and enhanced services directly, but Judge Harold Greene's decision last year in the U.S. vs. AT&T antitrust case has caused the commission to reconsider this part of the question. Greene, without specifying whether the Bell operating companies would have to establish separate subsidiaries, said they could market terminal equipment beginning next year.

The FCC's recent decision, which granted the Bell operating companies a limited waiver of the Computer II decision so they could supply federal military and civil defense agencies with terminal equipment directly, is the latest in a series. Earlier, the commission said the Bell operating companies could market terminal equipment directly to physically handicapped customers. But it denied Teletype Corp., an unseparated AT&T subsidiary, permission to market its products directly.

Group to Update IEEE DP Dictionary

SAN DIEGO — The Institute of Electrical and Electronics Engineers (IEEE) Computer Standards Committee has initiated a project to update and enhance IEEE's draft standard *Computer Dictionary* published by the group in 1979.

About 85 people have joined the group to date and are organized into nine subject-area groups: methodologies, computing milieus, software, applications techniques, coordination and consistency, mathematics of computing, theory of computing and hardware.

Expected to be completed in December 1984, the dictionary will be offered both as a hard-cover volume and electronically through commer-

cial data base services, a group spokesman said.

More information on the new dictionary is available from Jane Radatz the group's chairwoman, who can be reached through Logicon, Inc., P.O. Box 85158, San Diego, Calif. 92138.

FCC BOC Investigation Yielding No Surprises

WASHINGTON, D.C. — There were no surprises in the initial comments to the Federal Communications Commission in its investigation of the Bell operating companies separate subsidiary question.

Southern Pacific Communications Co. and Western Union Telegraph Co. said separation was essential; the

National Association of State Regulatory Utility Commissioners and the New York Public Service Commission said the decision should be left up to the states; and Commerce said separation was unnecessary.

The Bell operating companies, Commerce observed, "will lack national market power and, in any event, [are] heavily restricted as to their competitive offerings."

Goldwater Introduces Updated Version of Bill

WASHINGTON, D.C. — Sen. Barry Goldwater (R-Ariz.) has introduced a beefed-up version of the international telecommunications bill he tried to get enacted last year. The

new bill, S. 999, addresses a number of controversial issues:

- It authorizes appointment of a "White House special representative" who would be this country's chief spokesman at international telecommunications meetings and the chief coordinator of telecommunications policies developed within the federal government.

- One year after enactment of S. 999, all U.S. international communications services would be deregulated automatically, unless the Federal Communications Commission decided they were not subject to "effective competition." Another consideration would be the interests of foreign governments, who generally oppose deregulation.

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FCC Petitioned to Modify Access Charging Plan

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — Users of AT&T's Centrex telephone switching system and customers of remote time-sharing service bureaus will be overcharged if the Federal Communications Commission's (FCC) proposed access charging plan is not modified, according to petitions submitted to the commission last week by telecommunications user groups and enhanced services vendors.

The object of their concern is a scheme the FCC unveiled last December that would change the way local telephone companies collect for the expenses they incur in completing interstate calls. The major change would require end users to pay a por-

tion of this expense directly. All of the local access charges associated with interstate dial-up and Wats calls are currently paid by interstate carriers, who pass the charges on to their customers. The FCC's direct-charging plan would raise rates \$4- to \$30/line/mo, beginning next January, for business users of these services.

Centrex users allegedly will be treated unfairly because they need a separate access line from each telephone terminal to the local telephone company central office. A private branch exchange (PBX) unit, by comparison, hangs six to 10 telephones on a single access line. Since the FCC's proposed access charge is a multiple of the number of access lines the user has, Centrex-equipped

customers would pay far more than those using PBXs.

If the FCC doesn't change this situation, according to the American Council for Competitive Telecommunications (formerly the Ad Hoc Users Committee), users will be forced to replace their Centrex equipment with PBXs. The resulting revenue loss will force the affected local telephone companies to raise their rates for other services, the committee added.

The commission allegedly can prevent this from happening by using "trunk-equivalency ratios" to determine the Centrex user's access charge. These ratios assume that most calls flowing through a Centrex originate and terminate at in-house

stations and do not go through the local telephone company's network. This policy, which is used to calculate certain existing telephone service charges, would reduce the presently proposed access fees for Centrex users by up to 90%, the council indicated.

Tymnet, Inc., which operates an extensive packet-switched data transmission network throughout the U.S., claimed its high-density rates would have to be raised 33% and its low-density rates 200% if the FCC's new plan is not altered. Specifically, Tymnet wants vendors of enhanced services treated as end users rather than carriers. Since the plan calls for the latter group to pay the biggest share of the local telephone companies' bill for providing access, this change would save enhanced services vendors a substantial amount and thus reduce the need to raise their rates.

If the plan is not changed and Tymnet has to charge significantly more, the company said "it will not take long for larger customers to recognize that... it is in their economic interest to obtain private-line facilities as a means of avoiding the pass-through of... access charges."

Rocket Failure Hinders Mission Of Nasa Satellite

Although the first space shuttle, *Columbia*, successfully placed two commercial satellites into orbit last year [CW, Nov. 15, 1982], the second shuttle in the National Aeronautics and Space Administration's (Nasa) fleet was not so fortunate.

On its maiden flight earlier this month, the shuttle *Challenger* failed in its efforts to place the space agency's own Tracking and Data Relay Satellite (TDRS) into geosynchronous orbit. However, Nasa officials expect the problem can be at least partially corrected.

Although the satellite was successfully deployed from the shuttle itself, the firing of the launching rocket's second stage ended prematurely, boosting TDRS only about 19,000 miles above the earth, instead of the required 22,300 miles, according to Leon Perry, a Nasa spokesman in Washington, D.C.

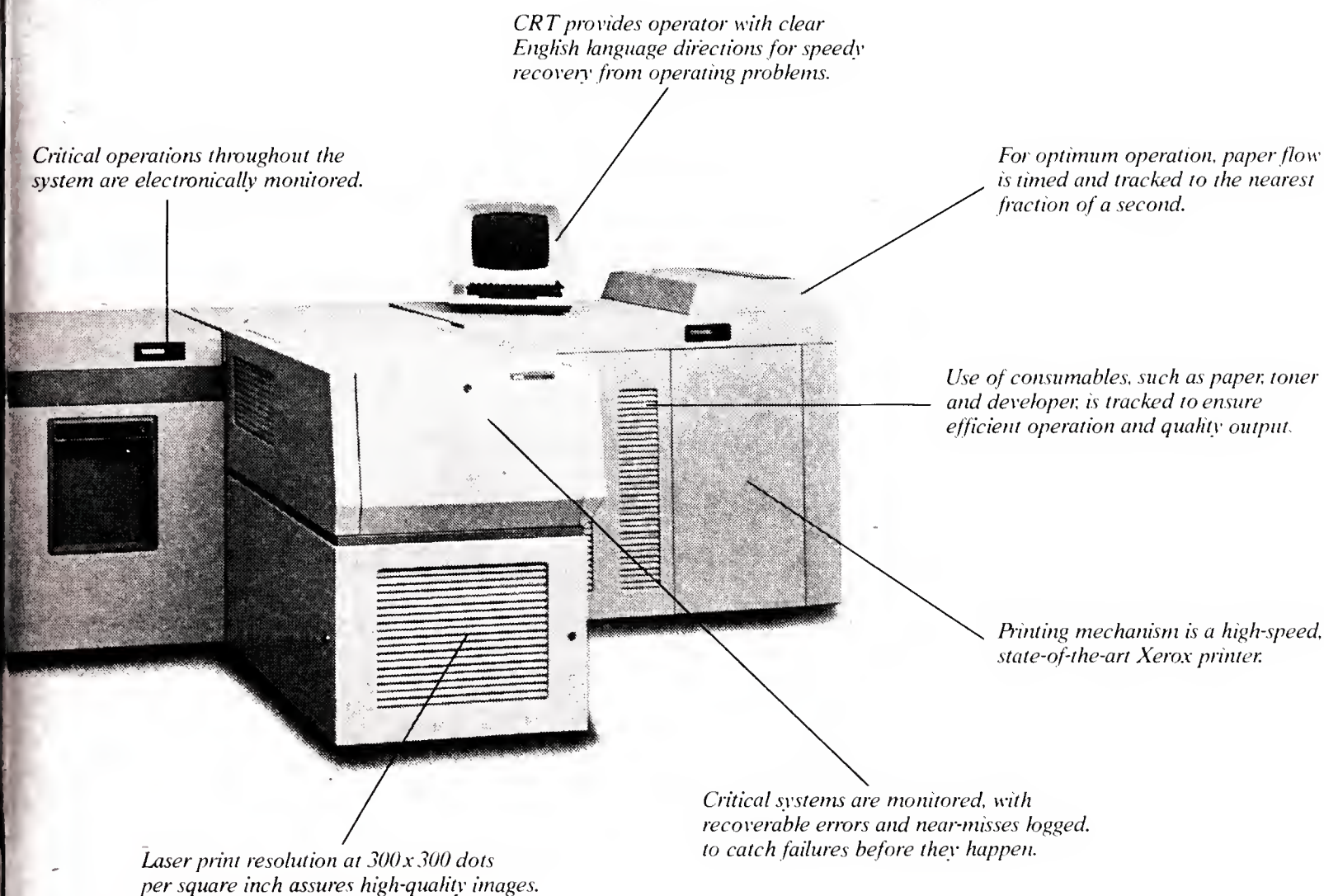
"TDRS is designed to give us constant communication with orbiting satellites and orbiting spacecraft," Perry said. The satellite is one of three that were planned to work in concert with each other — one over the Atlantic Ocean, one over the Pacific Ocean and one as a standby. When in place, the three satellites will minimize the need for ground stations to monitor Nasa hardware in space, Perry said.

When the TDRS ran into its first problems some five hours after deployment, Nasa also lost contact with the \$100 million satellite for two hours.

According to Perry, the rocket that was to launch the satellite into its correct orbit was designed by the U.S. Air Force, but the exact cause of its failure is still unknown.

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Cbema Initiates Drive to Stop Legislation to Control CRTs

PHOENIX — The Computer and Business Equipment Manufacturers Association (Cbema) is spearheading a drive to stop state legislation controlling the use of visual display units.

Disturbed by increasing allegations of health hazards, including radiation, caused by exposure to CRTs, Cbema has set up a special task force to respond to claims of health hazards.

Labor unions and women's groups are pushing for the passage of state legislation regulating the manufacture and use of CRTs. Connecticut, Illinois, Massachu-

setts, Maine, New York and Oregon, have proposals before their legislatures to regulate CRTs.

The proposals include the imposition of mandatory equipment features such as detachable keyboards and contrast control, regular eye examinations and frequent rest breaks for operators. Fines would be as much as \$1,000 for each violation.

"In all tests that have been conducted to date, visual displays have been found to be well within existing state, federal and international safety guidelines," Cbema President Vico Henriques said.

DP Guidelines for the '90s Higher Skills Needed: Study

NEW YORK — Computer operations will demand higher skill levels in the future as DP becomes more dependent on microcomputers, distributed processors, small business systems and telecommunications and less dependent on large CPUs, according to a study released by The Diebold Group, Inc.

The study, entitled "Guidelines for Effective Management of Computer Operations in the 1990s," said that the adjustments will be required by greater emphasis on capacity planning, performance monitoring, technical support, security management and facilities management. The study added that operations personnel will increasingly have to support

computing outside of the central DP organization.

The survey covered 100 major corporations. Among the other predictions are:

- Dramatic growth in telecommunications. Batch processing will decline to about one-third of the operations work load, while interactive and on-line transaction processing will increase to make up one-half of the activity in most DP organizations. Terminal additions to networks will increase 35% per year; the number of telecommunications controllers and front-end processors in use will rise 15% per year; and the requirements for telecommunications personnel will show an annual increase of 13% through 1985.

- Slowed budget growth. Hardware and operations personnel costs as a percentage of overall DP budgets will continue to decline at a 1% annual rate through 1985. Operations budgets will increase 12% per year during that time, but that is a significantly lower rate than in previous years.

- Personnel increases. Operations head count is projected to grow at a 4% annual rate through 1985, compared with a 5% annual rate for DP overall.

- Continued high software expenditures. Operating systems and systems management software costs will increase at a 17% annual rate through the survey period. By 1985, they will consume 5% of the overall operations budget in large corporations.

- Decentralized processing to skyrocket. Half of the survey respondents project over 100% growth in dispersed computing equipment, the study said.

The survey is available on a confidential basis to sponsors of the Diebold Multisponsor Continuing Programs from 475 Park Ave. S., New York, N.Y. 10016.

Meet to Cover Micros June 7-8

BOSTON — "Microcomputers and Organizational Productivity" will be the topic of a conference here June 7 and 8, sponsored by Micro Mainframe, Inc.

The two-day forum will focus on ways in which microcomputers have expanded the potential uses and benefits of information technology in organizations. It will also examine coordinated, systematic, professional exploitation of the hardware, software and communications capabilities of microcomputer technology.

Three speakers will be Peter Keen of Micro Mainframe, Inc., Mitchell Kapor of Lotus Development Corp. and C. Lawrence Meador of Research and Planning, Inc. The speakers will discuss new application opportunities in micro software, how the effective DP manager handles micros and other topics.

The registration fee for the conference is \$495. More information is available from Micro-Conference based at 215 First St., Cambridge, Mass. 02142.

Nielsen cable network product usage survey NHI Sept. 82. Subject to qualifications, available upon request.

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	COST \$(M)	GRP	INDEX	GRP	INDEX	GRP	INDEX
NETWORK SPORTS SCHEDULE (6 SPORTS ANNOUNCEMENTS)	250.0	32.3	100	26.8	83	27.3	85
NETWORK + ESPN (5 NETWORK SPORTS 8 ESPN ANNOUNCEMENTS)	250.0	30.1	93	34.8	108	42.3	131

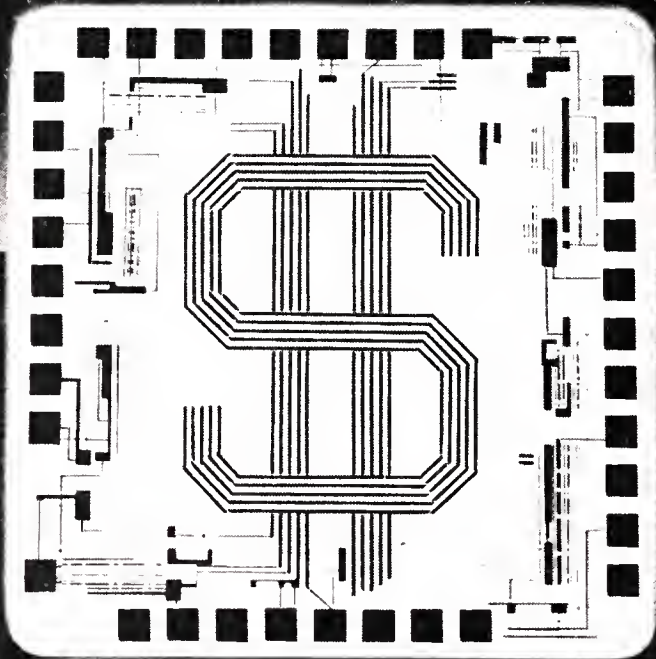
SOURCE: July '82 NTI On-Line Cume Facility Costs based on 1982 industry estimates.

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THE TOTAL SPORTS NETWORK™



Photo by M. Gaffney

Archie McGill has been at AT&T for 10 years. Appointed vice-president of business marketing at AT&T in 1978, he became president of American Bell, Inc.'s Advanced Information Systems division last Jan. 1. In what is today one of the telecommunications industry's most visible positions, McGill serves as the chief marketer of communications systems and services to business users for American Bell, AT&T's recently formed separate subsidiary.

When McGill — who earned a degree in economics and philosophy and speaks both Russian and Japanese — joined AT&T in 1973, he had 13 years of experience at IBM, where he was in charge of product planning for the Data Processing Division. He also spent four years as head of his own consulting firm, which listed among its clients Prudential Insurance Co., Seiko Instruments, Inc. and Fujitsu Ltd.

Possibly because of his years at IBM and AT&T, McGill speaks softly, chooses his words carefully and deftly and fends off questions he does not want to answer. And, like any good salesman, he has a well-developed ability to see roses where others find only thorns, as his statement about why users should subscribe to AIS/Net 1000 despite its present price/performance shortcomings indicates.

McGill was interviewed in his Morristown, N.J., office late last month by Computerworld Senior Editor Phil Hirsch.

American Bell's McGill On PBXs, Net 1000, Strategy for the Future

How would you answer the user who says that integrated voice/data private branch exchanges (PBX) are not as cost-effective as separate, dedicated switching systems?

A few years ago, people looked at communications as an expense to be minimized. If that school of thought was the guiding light today, what your user says would be true.

But communications can't be looked at any more as an expense to be minimized. You have to look at it as a vehicle for achieving corporate objectives — improving market share, increasing revenue, reducing expense. In other words, it is a key corporate management tool.

One result of this new focus is that information systems management people are going to be elevated radically in the corporate hierarchy. That's already the case in leading-edge companies.

What kinds of enhancements are planned for the the Dimension AIS/System 85 voice/data PBX system unveiled by American Bell in January?

We will be expanding the system upward and downward, adding significant functional capability. We've said integration of AIS/Net 1000 and System 85 is crucial — that will become obvious this year. Also, we will continue to add to the terminal family.

Is there a personal computer in the works?

When we talk about terminals, we are really talking about workstations. It's very obvious that once you develop an intelligent workstation, as we have, it provides the basic capability to support multiple functions such as word processing and personal computing.

We expect to have an effective family of intelligent workstations. There will be additional announcements in 1983.

In other words, you are adding functional capability incrementally so that at some future time you are going to have a workstation that can perform personal computer func-

(Continued on Page 16)

David Recommends GTE

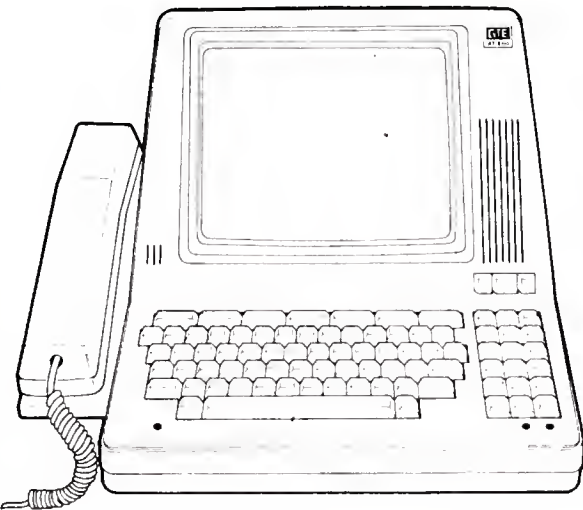
David Jamison Carlyle Recommends GTE.

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Call or send for DJC's 1983 Terminal Comparison Chart, as seen in Computer Decisions.



Photos by M. Gaffney

'We knew when we started marketing Net 1000 that its price/performance in certain areas had to be improved ...'

... We plan significant price/performance improvements in every facet of the system.'

(Continued from Page 15)
tions along with others. When will your workstation reach that point?
I can't tell you that.

What has been the user response to the System 85 so far?

I can't tell you how many orders we've booked, but I can say that we have far exceeded our initial projections. A very high percentage of the initial System 85 orders have been for what we call full-function systems. This is very gratifying because broad functional capability is a key element of our long-term development strategy.

Is AIS/Net 1000 commercially available? If so, what is its current status?

We now have three service nodes in operation and fewer than 20 customers, but once the [Basic Packet-Switching Service (BPSS)] tariff is approved by the [Federal Communications Commission (FCC)], we will have the ability to deploy the system ubiquitously. If the tariff is approved soon, which we expect, Net 1000 should be accessible by the end of this year just about anywhere in the country.

Is BPSS essential to the success of

Net 1000?

Because of its packet networking capability, BPSS provides universal interconnectivity at the lowest possible cost. There are alternatives, but they are less desirable.

Some users have told us that Net 1000 is expensive — specifically, that using its forms definition software costs considerably more than buying an equivalent package from, say, [Cullinet Software, Inc.] or Software AG. Also, we have been told it is cheaper for a user to buy his own disk storage unit than to store data within Net 1000.

We knew when we started marketing Net 1000 that its price/performance in certain areas had to be improved. We plan significant price/performance improvements in every facet of the system.

I would say that today, price alone is not a good reason for a customer to choose Net 1000. I am suggesting that the customer look at Net 1000 as a vehicle for the future; he should use it and get an understanding of it because those who get on the system early are going to be the ones who reap the benefits of the price/performance improvements and functionality enhancements that come along.

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Pointers on Computer-Based Training

By Katherine Hafner
CW Staff

BOSTON — If you think computer-based training (CBT) might solve some problems in your firm but you are put off by the implementation effort tied to CBT, Peder Hansen of the Internal Revenue Service can offer a few solid suggestions.

Hansen, a team leader for computer services training at the IRS national office in Washington, D.C., is in the midst of implementing one of the agency's CBT systems.

Speaking at the Computer-Based Training Conference here last week, sponsored by Boston-based *Data Training* newspaper, Hansen had some pointers for training managers based on his own experience that could help ease the cumbersome process of long-range planning for a CBT system.

Costs between classroom training and computer-aided instruction can differ radically, Hansen said. In the long term, by saving on personnel and material costs, CBT can reduce training costs to a fraction of the price of classroom instruction, he added. But it is all a matter of "selling" a CBT project to those who hold the purse strings.

Specific Problem Solver

Hansen's foremost emphasis lay on the importance of pointing at specific problems to be solved with a CBT system as opposed to classroom training. In order to sell the project to the decision makers, Hansen said, "you must identify a specific problem, not the symptoms of a problem.

"Make sure you identify the training requirement and that it's clearly understood," Hansen said. "It's the reason why you need CBT and not what you need that matters most."

Hansen also suggested that his audience draw up a list of advantages and disadvantages that compares different instruction methods when presenting a project proposal "so CBT comes out shining like a star."

In order to allay people's fears about interacting with a machine, Hansen suggested including in any presenta-

tion a full demonstration on the equipment.

"Give them something basic. Get a person to sit down and play with the system," he said.

Hansen's additional suggestions for training managers hoping to implement a CBT system were:

- Utilize in-house resources, such as a training coordinator who has the necessary expertise in setting

objectives, or an information center, where people are knowledgeable in handling technical problems.

- Evaluate the CBT system based on student performance, both internally using on-the-job simulation and externally by finding out if the student used what he or she learned.

- Try to reduce a portion of the expenditure by offering the training to other ap-

plicable departments, which might then share some of the cost.

- Determine what the short- and long-range hardware plans are for your company and their possible effect on your CBT plans. If adding to your computer system's capacity in order to accommodate the CBT project, examine how other aspects of the organization are affected.



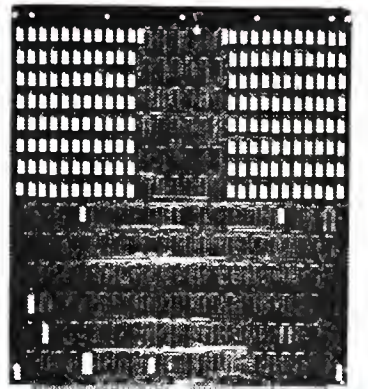
CW Photo by K. Hafner

Peder Hansen

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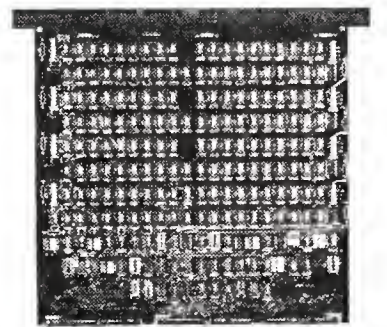
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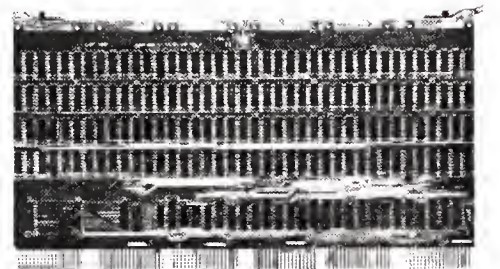
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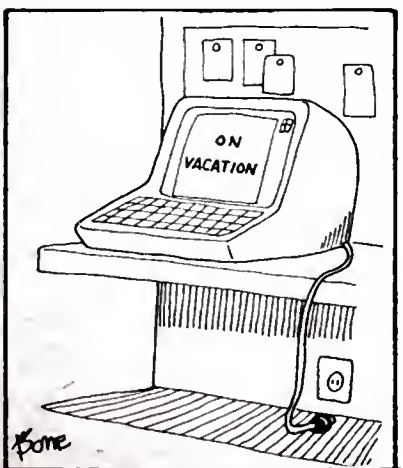
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Senate Supports Rejection of Reagan NBS Cuts

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — The full Senate has adopted a committee recommendation to reject the Reagan administration's proposed cut in National Bureau of Standards (NBS) DP standards activities.

The April 7 Senate vote, if matched by the House of Representatives, will authorize a \$10 million fiscal 1984 budget for the NBS Institute for Computer Sciences and Technology (ICST). That figure, equal to the 1983 ICST budget, would have been cut to \$3 million under the Reagan proposal.

The administration argued that NBS should leave DP standards development to the private sector and

should concentrate on adopting appropriate private standards to the federal government. That plan has been sharply criticized in Congress and from various sectors of the DP and academic communities, who contend that NBS has a vital role in standards development.

Faced with that criticism, the administration said last month that it is reconsidering its proposed ICST budget cuts. Late last month, the Senate Commerce, Science and Transportation Committee recommended full restoration of the ICST budget, saying the cuts are inappropriate given the increasing importance of DP/telecommunications technologies to the government and the country [CW, April 4].

Update of U.S. Export Plan Seen Heavy on Controls

WASHINGTON, D.C. — After considerable delay, the Reagan administration has unveiled its proposed update of U.S. export controls, and as expected, the proposal is heavy on controls, light on exports.

Presenting the planned amendments to the soon-to-expire Export Administration Act, Lionel Olmer,

under secretary of Commerce for International Trade Administration, said the Reagan bill properly changes the current law's emphasis on promotion of exports to highlighting "the consequences of failing to prevent or delay the transfer of militarily sensitive technology."

Although the bill calls for decontrolling end products and concentrating on controlling the underlying technology, the major revisions to the law are aimed at tightening enforcement of export controls. For example, the White House asked for new criminal sanctions against conspiring and attempting to violate the export control law.

As indicated earlier by Olmer, the Reagan bill would mandate negotiations with U.S. allies and other countries in an attempt to strengthen multilateral controls on exports to the Soviet Bloc [CW, April 4]. Export controls for foreign-policy purposes, which have been a great source of irritation for U.S. firms, were defended by Olmer, although the new bill would alleviate some of the liabilities of firms doing business with a country that suddenly falls from White House favor.

On the subject of streamlining export license processing, Olmer committed the government to cutting the paperwork and processing time.

SEC Moves to On-Line Aid To File Agency Documents

WASHINGTON, D.C. — The Securities and Exchange Commission (SEC) is moving forward with its plans to create an on-line system for filing and retrieving the tens of thousands of corporate documents submitted to the agency every year.

Under law, corporations must file with SEC a variety of documents, including stock prospectuses, annual reports to shareholders and proxy statements. The speed and ease with which they are available to the public and to stockbrokers influences everything from the purchase of stock to corporate takeover attempts.

SEC would like to make the documents available in a paperless system that would be accessible through private terminals and personal computers. The agency, now seeking public comment on its ideas, is considering awarding a contract for development of a prototype system for a one-year trial.

Service Lists Micro Software

LAFAYETTE, Calif. — A service that reportedly combines the selection of microcomputer software programs with software evaluation has recently been introduced here by Interactive Tele-Marketing (ITM).

The "one-stop-shopping" ITM service provides access to micro software packages and consultants. The service includes information on software experts, special software reports and catalog listings.

ITM membership costs \$100 annually. Further details are available from ITM, Suite E, 936 Dewing Ave., Heritage Square, Lafayette, Calif. 94549.

Washington Update

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SNA COMPATIBILITY: MAJOR VENDORS						
VENDOR	MAINFRAMES	METHOD OF CONNECTION	MINIS	METHOD OF CONNECTION	TERMINALS AND PERSONAL COMPUTERS	METHOD OF CONNECTION
Burroughs Corp.			CP 9500	CM 9500 SNA Gateway CM 9500 IMS Software CM 9500 RJE Software		
Data General Corp.			Eclipse MV Series 16- and 32-Bit Versions	SNA 3270 Software DG/SNA Software DG/SDLC Software Bit Synchronous Communications Board		
Digital Equipment Corp.			VAX-11s on Decnet	Decnet/SNA Gateway	Rainbow 100	Polygon Associates, Inc.'s Poly-BSC/RJE Poly-BSC/3270 Software
Hewlett-Packard Co.			HP 3000	Interactive Mainframe Facility Software Intelligent Network Processor		
Honeywell, Inc.			DPS 6	SNA RJE Software, SNA File Transfer Software	Micro System 6/10 Personal Computer	Through Honeywell's Distributed Systems Architecture
NCR Corp.	NCR 9300	SNA Software Modules	The Tower	Multiprotocol Communications Controller Board and SNA/RJE Facility Software	Model 7901 Terminal Model 7900 Terminal	SNA/3270 Emulation Facility
Tandem Computers, Inc.			Non Stop II	Snax Software		

CW Chart

SNA Heads for De Facto Standard Niche

(Continued from Page 1)

Boston-based Yankee Group. The first and most difficult method is emulation.

With this method, the vendor creates an architecture that correlates to each of SNA's seven layers. "That's expensive and difficult," Kutnick pointed out. "Most layers don't match up perfectly, and IBM keeps changing and adding layers. If you go the layered route, you're probably going to become plug-compatible."

Two companies that have at least attempted something close to this are Amdahl Corp. and NCR Comten, Inc. Comten, a subsidiary of NCR Corp. that develops connectivity strategies for NCR and IBM environments, has been sued by IBM for its copying job. And Comten, in turn, has countersued for restraint of trade, according to L. David Passmore, staff consultant at Network Strategies, Inc. in Burke, Va. The suit means Comten's architecture could be delayed indefinitely in the courts.

Amdahl, on the other hand, "can take IBM's code and run it on their own hardware," Passmore said. But

Product Spotlight

'Just how well and how soon various minicomputer manufacturers become SNA-compatible may determine much of their future markets. DEC is thought to be in the lead with its architecture, while many others are just allowing their minicomputers to look to the IBM host like a 3270 terminal.'

with the introduction of IBM's new communications controller [CW, March 14], "they'll have to start worrying about becoming 3725-compatible because IBM is sure to come out with more features for SNA."

The second method of SNA compatibility is through the use of a gateway, Kutnick said. With this method, "you take the top two or three layers of SNA and provide everything else," Kutnick said.

"Digital Equipment Corp. functionally mimics IBM's architecture but doesn't emulate it," Kutnick continued. "The advantage of this is you don't have to watch what IBM is doing all the time. But you have to have

the wherewithal to create your own architecture."

Just how well and how soon various minicomputer manufacturers become SNA-compatible may determine much of their future markets. DEC is thought to be in the lead with its architecture, while many others are just allowing their minis to look to the IBM host like a 3270 terminal.

Hewlett-Packard Co., Data General Corp. and Honeywell, Inc. are three examples of vendors with this type of 3270 method. Tandem Computers, Inc. is somewhat more advanced with its Snax interface.

"Prime [Computer, Inc.] is the furthest behind all the minicomputer

vendors," Kutnick said. But Prime last week reassured its users in a press release that SNA compatibility for its Series 50 minicomputers is just around the corner — due in late 1984 and early 1985.

The importance of not falling behind the pack in SNA compatibility revolves around the fact that a vendor has to get the first step out of the way. That step is simply to devise an interconnect facility. Once that is accomplished, the vendor can develop its own network architecture that will work with SNA through a gateway without "cross mapping" to each SNA layer.

But even DEC, with its more advanced gateway, is not perfect, and any connection to SNA with hardware other than IBM's (and sometimes even with hardware from IBM) results in the loss of some functions. It's really up to the individual user to determine which loss of function is most tolerable for him, noted Frank Dzubeck, president of Communication Network Architects, Inc. of Washington, D.C.

Mainframe vendors such as Sperry Corp. and Control Data Corp. have less need to become SNA-compatible since "at the moment, there is no need to put a mainframe in the SNA network," observed Dr. Wushow Chou, director of the computer studies program at North Carolina State University.

No discussion of SNA compatibility would be complete without mention of the International Standards Organization's (ISO) Open Systems Interconnection model. ISO, like many standards groups, is fighting a tough battle.

ISO is attempting to create an SNA model that will make each layer a standard for the international communications industry. This standard would then allow hardware manufacturers to build "peer-to-peer" architectures instead of the more commonly found "master-slave" architecture. But with so many vendors opting to build their own architectures and a solid SNA gateway, more than one industry expert has said, "by the time those standards come out, they won't matter."

Peeling Off Layers of SNA Confusion

If you find yourself confused about Systems Network Architecture (SNA) compatibility, it might be a good idea to review SNA itself.

Simply put, SNA is IBM's method of tying together its hardware in a network for file transfer, remote job entry and an array of other common applications.

Running in concert with its 370X communications controllers, SNA is a seven-level set of rules for the design of nodes in a distributed data processing network.

According to a 1981 study on SNA by International Data Corp. (IDC), SNA hardware and software can be grouped into four categories:

- An IBM 370, 30 series, 3080 series or 4300 host.
- An IBM 370X programmable communications controller running some release of IBM's Network Control Program.

- A proper version of an access method such as Vtam or Tcam.

Synchronous Data Link Control (SDLC) and some type of SDLC compatible terminals. SDLC replaced IBM's Binary Synchronous Communication (BSC) in 1973, but BSC terminals will operate in an SNA network along with IBM 3270 terminals.

Commonly found adjacent to SNA in acronym form, SDLC "initiates, controls, checks and terminates information exchanges over communication lines," IDC reported. SDLC permits some communication functions to be handled at the terminal location and allows different types of terminals to be integrated on the same line.

SNA Introduction

SNA was introduced in 1974 and replaced 35 separate teleprocessing access methods and 15 data link con-

trols. "Terminals were dedicated to applications and each time a new DP job was installed, a complete network was designed to interact solely with the application," the IDC report states.

The new architecture was introduced to allow modification or changes to one subsystem without having to change all the others.

This was accomplished through a layered architecture that, to this day, still baffles many seminar attendees when experts begin to diagram SNA's seven layers and their purposes.

Only the first three layers of SNA concern compatibility since these are the three that are commonly penetrated.

They are the physical, data link and network layers and as one expert said, "the only three layers that the user sees or cares about."

Floods Bring Down New Orleans Phone Service,

By Susan Blakeney
CW Staff

NEW ORLEANS — As it did for Tom Sawyer and Huck Finn, the Mississippi River swelled and churned with high adventure for one DP director here when heavy rainstorms turned this city into an urban bayou, void of power and telephones.

"Yes, the floods did have an interesting effect on Thursday [April 7]," remarked Joe Walker, data processing manager for the city of New Orleans. Even though his third-floor data center did not get wet, its operations were nonetheless paralyzed by the wrath of nature. "We have 178 police terminals connected to our on-line systems. When the phones went down, the police files were inaccessible," he explained.

Walker's City Hall-based operation provides the police with instant access to its criminal, warrant and modus operandi files. The interactive system is also used to book suspects upon arrest, he noted. The entire network runs over phone lines.

The telephones throughout the city were rendered useless when South Central Bell's switching equipment shorted out as its building

flooded. An emergency battery-operated generator was then activated, but could only sustain the phone system from about 5 a.m. to 11:15 a.m., when the batteries were finally drained. Telephone service was not fully restored until Thursday evening around 5:30 p.m.

Losing Phones

"Losing the phones was much worse than losing [electrical] power," Walker stated. "We operate 24 hours a day, 365 days a year because of that police network. Our No. 1 priority is to keep it up and running always."

Walker said his staff of 73 works on three shifts to accommodate the needs of the police and fire depart-

ments, and it uses dual CPUs, two IBM 4341 Group Model 2s, to assure continuous service to these and other agencies.

Although Walker's electrical power was temporarily knocked out around 4 a.m. for about 20 minutes, "Both 4341s came back immediately without us effectively losing anything. We didn't even need IBM's help." The only snafu came when "One bank of 3340 disk drives did not respond when power was restored."

"IBM couldn't get anyone to us," Walker continued. "Our field engineer lives on the west bank [of the Mississippi River], and all the approaches to the bridge were flooded out."

"Finally, we got him to instruct one of our technical people over the phone. There was a series of things to check, and they found that the thermal coupler switches had been thrown during the power failure. They [thermal switches] are supposed to shut down the system during emergency situations like fires," Walker said.

But the city's computer center was no sooner back up and running when it lost all its phone lines, which prevented scores of law enforcement agencies from accessing or entering data on the police files.

"I don't know how many inquiries were attempted, but we usually handle about 115,000 a day. Besides the New Orleans Police Department, we

Program Offered In Info Studies

SYRACUSE, N.Y. — Syracuse University's School of Information Studies has instituted a formally defined program for an undergraduate minor in information studies that can be combined with a major in any undergraduate degree program.

The objectives of the 18-credit information studies minor program are to examine information in society, to provide applied skills in using computers for information work and to explore career opportunities in the information field.

The information studies minor program curriculum includes four courses that are required: "Introduction to Data Processing" or "Computer Applications for Social Scientists"; "Information Resources"; "Introduction to Information Science"; and "Gathering and Evaluating Information."

The School of Information Studies is located at 113 Euclid Ave., Syracuse, N.Y. 13210.

DP Trainers Meeting Slated for June 23-24

STURBRIDGE, Mass. — The New England Data Processing Trainers Conference, sponsored by the Association of Data Processing Trainers (Adapt), will take place here June 23-24.

Sessions for this event include "Being a Professional," "Dressing for a Positive Image" and "Training Computer Operators." The list of conference speakers includes Aaron Goldberg of International Data Corp., Fran Rodgers of Lake Systems Corp. and Rick Ream of Deltak, Inc.

Registration for the meeting costs \$50. Further details are available from Adapt's Ronald Hadley at Polaroid Corp., 750 Main St., 2E, Cambridge, Mass. 02139.



Paralyze City DP Center's On-Line Systems

support the [Federal Bureau of Investigation], the Secret Service, the U.S. Postal Inspector, the Federal Bureau of Customs, the state police, the Mississippi River Bridge Authority, the harbor police and more," Walker said.

"Of course we couldn't call the telephone company — they were having their own problems," Walker chuckled. "They were bringing in car batteries, trying to power the thing back up!"

Had it been a more normal day, Walker asserted, losing access to the police network would have been more critical.

"The police were busy evacuating and protecting areas from looters... it was not business as usual for the

Police Department.

"I think there would have been more of a panic if we lost all the phone lines on a normal day like today" As for the loss of electricity, Walker commented that if it had to happen, 4 a.m. was a "good time for a power outage."

Walker said that while he does not have a written disaster recovery plan, all of the DP department's on-line files are backed up on a daily basis. "Everything's copied onto tape and taken from the east wing of City Hall over to a fireproof vault in the west wing.

"We worry more about hurricanes down here and bombs," Walker concluded. "We've never lost our phones before."



CW Photo by S. Blakeney

Trouble at the telephone company caused problems at city hall for city of New Orleans DP Director Joe Walker. In the wake of the recent storms, Walker conceded, "It could have been worse."

DP Departments Of Two Banks Survived Storm

NEW ORLEANS — Despite torrential rains that flooded much of this city, causing power and telephone outages, two major financial institutions' data processing departments here fared pretty well.

Chris Otto, senior vice-president of information systems and services for the Bank of New Orleans, said his bank was in "good shape" because it never lost electrical power and did not flood. But because high waters throughout the city prevented most employees from getting to work, the bank was closed for business on Thursday, April 7.

The Bank of New Orleans' data center services about 15 other banks in the area, all of which were closed as well, Otto explained.

"We missed a day of processing — that's all," he said, "so we'll do two days' worth of processing tonight."

Otto agreed that the lack of telephone lines would have made business difficult, if not impossible, for him under ordinary business circumstances, but because the bank was closed and "the city was paralyzed... people's minds were not on banking."

At Another Bank

Concurring with Otto was Al Voltolina, director of data processing at the Whitney National Bank of New Orleans. "The bank was shut down so the flood really had no effect at all."

Voltolina went on to say that his bank's computer center operated Thursday night as usual, with full capacity. "I had communications lines operating with no problem at all," he said. "The point-to-point communications lines to two different data centers were completely unaffected."

Neither Otto nor Voltolina knew of any banks or businesses whose computer systems crashed or were damaged by the storm.

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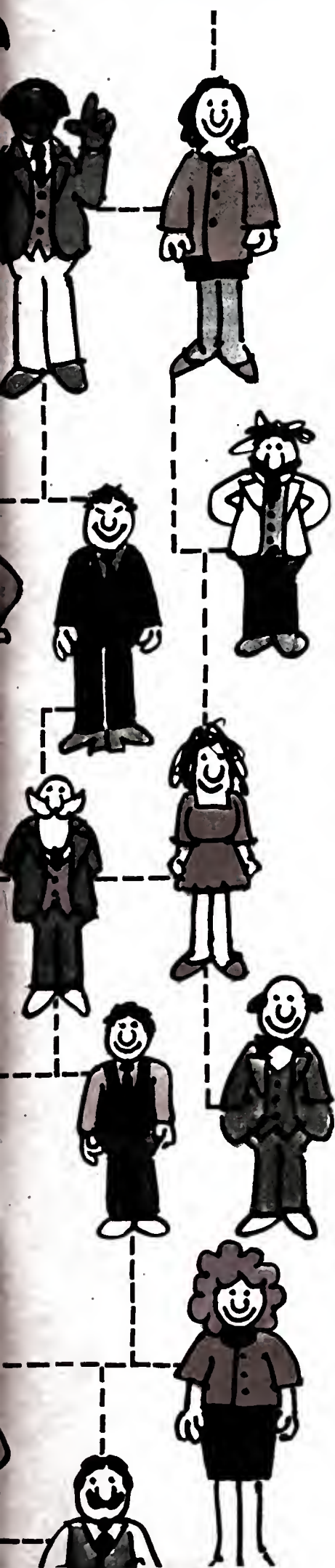
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Choosing the Right DSS

DSS Seen Useful Analysis Tool for Managers

By Susan Blakeney
CW Staff

NEW ORLEANS — One of the first statements from Ashok Nagrani on decision support systems (DSS) was an unequivocal "We're not going to talk about spreadsheets."

Nagrani differentiated the true DSS from a spreadsheet "calc-type" package by not-

ing that DSS models were not limited by the system's memory, while spreadsheets — those "notorious memory hogs" — were memory resident and therefore limited. Nagrani also pointed out that DSS were of modular design, offered multipage report printing and extensive spelling functions, while spreadsheets were, at best,

CW at TI-MIX

"clumsy" in these areas.

DSS, according to Nagrani, president of Antech, Inc. in Roswell, Ga., are software packages designed for professionals. "They are

tools aimed at the manager who has to analyze business problems... those managers who learned management theories and formulas too long ago too remember them.

"You could go look them up in management books, but it takes too long and they're too cumbersome to implement by hand," Na-

grani told his audience at TI-MIX, the Texas Instruments, Inc. National Users Group meeting held here recently.

Instead, Nagrani recommended the careful selection of a DSS software package to automate business problem solving with models. "Modeling," he asserted, "is nothing more than the mathematical representation of a problem. But it allows the manager to become a better manager by enabling him to translate the problem into math."

At last count, according to Nagrani, there were roughly 35 "credible" DSS packages on the market. In terms of picking the right one, Nagrani advised his audience to "compare your specific needs to the system."

Nagrani suggested the DSS shopper start by looking closely at the package's documentation. "How good is it? Does it look like a shoddy piece of work put out as an afterthought? Because if the documentation is bad, there's something lacking in the product."

"On the other hand," he warned, "just because the documentation is slick it doesn't necessarily mean the package is great."

Next, Nagrani said users should find out how much vendor support is available with the DSS. "Do they have a hotline? Are they planning enhancements?" he asked.

Another DSS consideration listed by Nagrani was, "Is there a sample model available? If there is, you can really make sure the models fit the job."

Nagrani also advised the potential DSS buyer to examine the data entry part of the program.

"Make sure it's easy. It should be so easy that the user does not have to go rebuild the whole model to change one value. You should be able to address any row, column or cell in the program," he said.

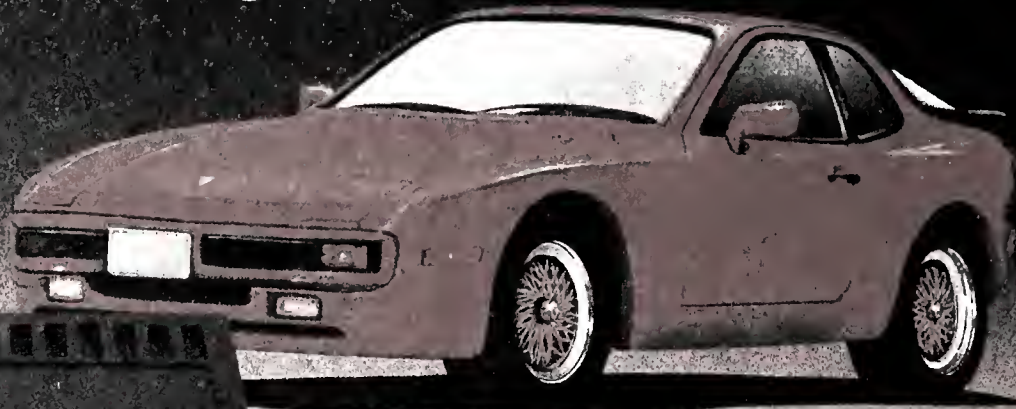
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RACAL

Exec Stresses Five 'Fs' in Employee Relations

By Susan Blakeney
CW Staff

NEW ORLEANS — Managers should remember five "Fs" when dealing with employees: be friendly, frank, fair, faithful and firm.

So said Jacqueline White, vice-president of Concord Management Systems, Inc. of Greenbelt, Md., in an address on "Hiring, Motivating and Keeping Competent Technical Personnel" at Texas Instruments, Inc.'s TI-MIX 1983 International Symposium held here recently.

White asserted that employees in the DP industry are unique in many ways. "With an expanding job market, the demand for good people is much higher than the supply. We're also faced with high turnover rates," she said.

"There is very little traditional company loyalty out there. What you will find is a sense of loyalty to DP and loyalty to specific hardware, but not company loyalty," White said.

Match Personalities

She advised managers to try to match employees personalities to their particular firms' strengths. "Don't try to keep a 'big company' personality in a small company."

Before hiring, White advised her audience to review their company philosophy and establish a manpower planning team. "I know this may sound optimistic and grandiose for the smaller companies, but you've got to do it."

"Ask yourselves three questions," she continued. "Who are we? What are our goals? And who can we get to accomplish these goals?"

Another preliminary step White recommended to management at this point is to evaluate the economic forecast for the industry and the company. "You don't want to hire someone only to have to lay them off three months later."

Job Description

Next, managers should write a detailed job description, listing specific functions to be fulfilled and characteristics needed to achieve them. She warned against compulsively hiring somebody because someone keeps saying "We've just got to have someone else in software." Don't throw people at a problem!" she stressed.

The next step is to identify and evaluate recruitment sources. These may include, according to White, current employees, former employees, employee referrals, other companies, advertising, colleges and universities, walk-ins, resume senders, placement agencies and, finally, search firms.

White mentioned that many companies are using new techniques such as Sunday toll-free 800 numbers in their recruitment advertisement campaigns now, because many technical people do not have up-to-date resumes, and/or cannot present themselves in writing very well.

White also made note of open houses and advertising on classical music radio stations since, she said, it has been discovered that many technical people favor symphony music.

During the interviews, White urged the manager to know the job

description, prepare to control the interview and represent the job and company fairly. It is

also wise, White added, to represent the company in style and demeanor. Do not make the interviewing mistakes of having a messy office or being sloppily dressed.

Tools for further screening beyond the initial interview, White said, could include tests that relate specifically to the job, writing samples, verification of school records, credit history check, solicited opinions from others in the office and reference checking.

"I'm amazed at the number of peo-

CW at
TI-MIX

ple who don't bother checking references," White said. "Although you rarely get a negative

reference, pauses of silence can tell you a lot," she pointed out.

She also reminded managers of the host of ability and temperament surveys available for additional testing instruments.

Once the manager has prepared, recruited, interviewed and secured the desired employee, White said managers must motivate them.

"You've got to convince them to perform and replace their individual goals with your group objectives," she stated.



CW Photo by S. Blakeney

Jacqueline White

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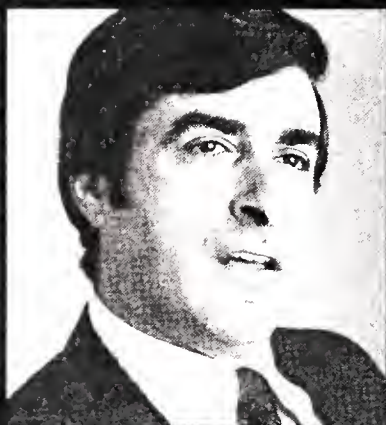
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Critical Success Factors Seen Key in MIS Planning: Exec

By Paul Gillin
CW Staff

BOSTON — If top management drives the planning process for a full-scale management information systems (MIS) implementation, the business is likely to reap a host of benefits.

That was the message from Edward McCarthy, vice-president of MIS at American Television and Communications Corp. (ATC) in Englewood, Colo. McCarthy outlined his company's use of the Critical Success Factors (CSF) method of information planning at a recent seminar sponsored by Index Systems, Inc. of Cambridge, Mass.

First proposed in 1979, CSF differs from most MIS strategies by involving top management heavily in the first half of the planning process and driving the process based on individual and current information needs, McCarthy said. The method has been used by about 200 firms nationwide, according to Dr. John Rockart, the MIT professor who developed the method.

ATC, a subsidiary of Time, Inc., is a cable television supplier that owns the popular Home Box Office service. The company grew more than tenfold between 1975 and 1982, McCarthy said, presenting a growth management problem.

In 1981, McCarthy was assigned to develop an MIS plan that would serve corporate headquarters and more than 100 regional offices. He adopted the CSF approach and hired Index Systems as a consultant.

CSF encourages management to settle on its top priorities before the MIS strategy even starts, McCarthy noted. "Because we don't understand DP, we tend to relegate that function and hope that costs can be kept below a bulge," McCarthy said. "If you — as a DP manager — can identify what has to go right for success, then DP resources can be pointed in that direction."

McCarthy and a consultant interviewed executives extensively to obtain lists of the key areas in which they felt the business had to succeed. The executives each spent 16 hours on the program over four months, he said. Asked to list their perceptions of the company's critical success factors, they named goals like managing properties effectively, increasing market penetration and increasing annual profitability.

McCarthy and the consultant also pressed management to quantify the critical factors so that they could be measured later, a step that was critical to the continuous reporting on the planning and implementation process.

An initial list was condensed to four key factors and then reviewed in an interim meeting with management. Each factor was then broken down into potential measures that MIS could take to achieve them, McCarthy said.

"We began developing an information structure that could be published in a series of reports," McCarthy explained. "We needed an MIS structure that both DP and management could understand."

Categories of MIS input included financial, services, human resources, maintenance and capital requirements/construction. Each of the five areas was then broken down into specific areas to which DP could contribute.

The major categories of DP involvement included central transaction systems, information systems, decision support systems and business unit systems, according to McCarthy.

The systems to be implemented were chosen and three target dates were set: one for the basic system, one for the expanded system and one for the integrated system. The implementation process will continue late into 1984, McCarthy said.

The management action that has been taken since the CSF process was initiated is the most rewarding factor, McCarthy said. A major research and development effort has been launched, along with an effort aimed at involving corporate and local offices in the license renewal process. A decentralization plan for the entire firm was initiated and a new property acquisition plan was put into effect.

Guidelines Outlined for CSF

BOSTON — When taking the Critical Success Factors (CSF) approach to implementing new information systems, management must follow several key guidelines, according to Edward McCarthy, vice-president of management information systems (MIS) at American Television and Communications Corp. (ATC) in Englewood, Colo.

Speaking at a recent seminar here about the CSF strategy, which emphasizes building information systems based upon success factors determined by top management, McCarthy said DP managers must be careful to get executive commitment from the start and to keep management informed about the project's progress every step of the way.

Some key success variables are:

- Timing. "Don't force the study or start it when everyone's attention is diverted elsewhere," he said. McCarthy waited six months before recommending the CSF approach at ATC.

- Get a sponsor to carry and sell the program. "MIS usually doesn't have the clout by itself," he said. "Sell the sponsor who in turn will sell the executive group."

- Gain executive commitment. Without this commitment, the project might as well be abandoned.

- Use a consultant, particularly at the executive level. Choosing success factors is very difficult to do internally, he noted. A consultant can assist at the interview stage and can help find trends in the CSFs identified by management.

- Publish a final document stating what CSFs were determined, what MIS will do about them and when.

Fearful of Losing Technical Skills?

Tips Offered on Easing Move to DP Management

By Marguerite Zientara
CW Staff

LYNBROOK, N.Y. — One of the hardest things for a DPer moving into a management position is for him to give up his hold on the technology and depend on his subordinates for their technical knowledge.

That is just one aspect of the very difficult transition from information technology worker to first-level manager of information technology workers, according to Richard DeFiore, managing director of Systems Management Associates here.

DeFiore conducts a "Transition to Management" course comprised of four day-long seminars — one held each quarter — for high-potential information technology workers and recently promoted managers.

Because technical leadership and management effectiveness call upon very diverse personal resources, DeFiore's course addresses the all-too-common occurrence of a "competent programmer or analyst becoming not a very good manager," he explained in a recent interview.

'Realistic Fear'

The DPer's anxiety about losing his technical skills when he moves into management is "a very realistic fear," DeFiore said.

"When a person moves into a managerial position, he has to change his focus from one of technologist to that of a manager and develop communications skills and people-management skills.

"He does have to keep pace with and have an understanding of the technology, but he also has to begin to understand that he is now working with other people to achieve organizational goals," DeFiore said.

A large part of the manager's process of "letting go" of his technical responsibilities lies in developing delegation skills, DeFiore said. "Most first-line supervisors have a lot of difficulty giving up their control."

In delegating tasks, a manager should "delegate the authority required to accomplish the job along with the responsibility," he said. But a manager should not delegate such basic management functions as organizing, setting objectives and coordinating.

Often, a manager will delegate a task to a subordinate, but never tells other people in the organization that he has done so. "What happens is that this person might go to other people and the reaction is, 'Who do you think you are, my boss?'" he said.

It is also important to develop subordinates' skills and at the same time be willing to accept some mistakes on their part.

In addition, "it's crucial to give the subordinate an opportunity to give his thoughts and feelings about an assignment," he added.

If possible, the manager should be able to have clear, measurable performance standards, DeFiore suggested, and should be available to give needed support when necessary.

"It's important to reward people when they've accomplished some-

thing and not only point out those areas that need improvement," he said. "It's crucial to remember that as a manager you can't delegate accountability — you're accountable — and the basic issue is one of trust in your subordinates."

One of the most important things a new manager must develop is communication skills, both with his subordinates and with upper management, DeFiore emphasized. Perhaps more than other managers, new information technology managers often have trouble with that, DeFiore said.

"With the educational background and on-the-job experience

they've had in the past, there's been very little need to communicate with people; most of their communication really has been with machines," he pointed out.

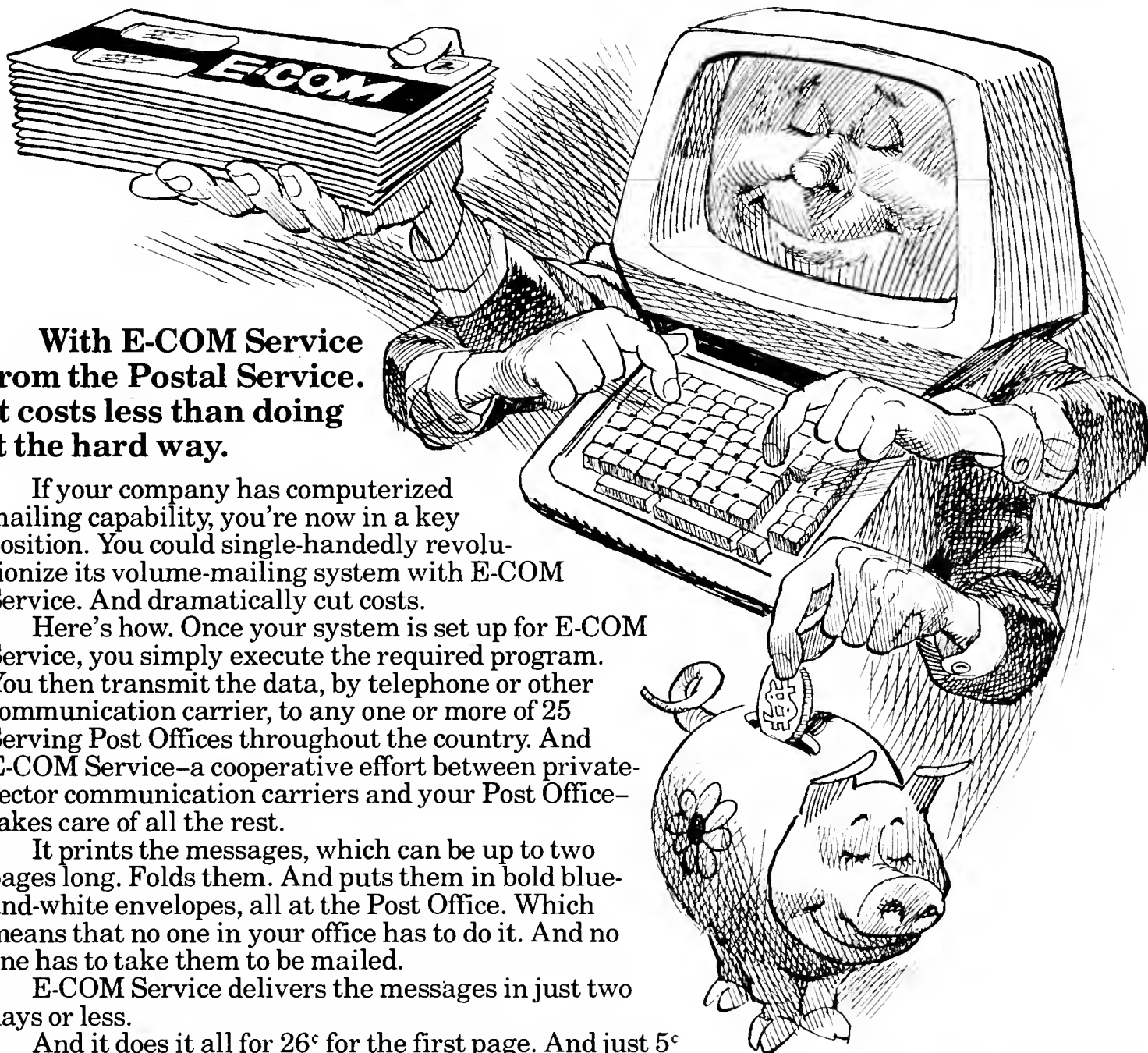
Specifically, communications skills include active listening, feedback techniques, how to resolve conflicts constructively and negotiating skills, he said.

DeFiore's "highly interactive" course employs a combination of self-appraisal, case studies, role playing, pair interactions and group discussions in teaching these skills. Systems Management Associates is located at 21 Linden Ave., Lynbrook, N.Y. 11563.



Richard DeFiore

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Douglas Strain

Users Apply to Their Jobs What They've Learned From Upper Management Course

A few words of advice flashed across a terminal screen resulted in a strategy change at Hewlett-Packard Co. in a corporate program that involved several million dollars and exercised "a reasonable amount" of impact on a large group of people.

Access to that kind of advice, according to HP's director of corporate engineering,

Charles House, is the key to the California-based School of Management and Strategic Studies (SMSS), an upper-level executive management program that takes place at the convenience of its participants over a computer network. Even more, it is what finally convinced him to sign on.

His concern over the rele-

vance of the liberal arts bent of the SMSS program had originally held him back from joining, even though he was excited about the concept of computer teleconferencing being used for educational purposes, House said.

But as House and other users found out, there are advantages to an on-line network of peers, who may

approach problems from a different perspective.

House, along with Douglas Strain, president of Electro Scientific Industries, Inc., is so intrigued by his experience that he will probably remain on the Electronic Information Exchange System (Eies), the nationwide network that connects SMSS members. Strain noted he has made a number of contacts on the Eies network that he plans to maintain. Provisions have been made at SMSS for alumni faculty who wish to remain on-line in the program.

Overall, students were enthusiastic about the course, which not only pushes them to consider alternative approaches to problems, but gives them a chance to apply what they have learned immediately on the job. "It gives you more options when decisions and problems come up," Strain said, adding that this is "the missing part" of executive education.

Since the visual barriers of face-to-face communication are removed, participants are judged solely on the depth and clarity of their contributions, according to students.

What impresses House is the effect teleconferencing has on quiet personalities. "You put them on a terminal, and they really blossom — you really find out what they think," he said.

Fuse to Meet May 8-12

NEW YORK — Fuse, the group for users of Information Builders, Inc.'s Focus data base management system, will hold its 1983 international conference at the Marriott Mountain Shadows Hotel in Scottsdale, Ariz., from May 8-12.

The conference highlight will be the planned formal announcement and release of PC/Focus for the IBM Personal Computer. A demonstration area at the conference will enable attendees to use PC/Focus.

The conference keynote address will be given by Hank Stram, former head coach of the National Football League's Kansas City Chiefs. Stram's speech, titled "Decision Support Systems in the NFL," will discuss the use of computers and decision support systems in the world of professional sports.

More information is available from Bobbi Feldman, Information Builders, 1250 Broadway, New York, N.Y. 10001.

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Addresses Changing Leadership Needs Program Uses Teleconferencing to Teach Execs

By Patricia Keefe
CW Staff

LA JOLLA, Calif. — Forget everything you ever learned in business school. That includes the business school classroom format, most of the theory, the tools and even the notion of education as a separate entity.

An alternative program designed to help corporate policymakers reach beyond short-term business solu-

tions is being offered by the School of Management and Strategic Studies (SMSS) here. And you won't miss a day of work. You don't even have to leave home.

The SMSS program is an automated version of the home correspondence course created to address what director Richard Farson sees as the changing needs of leadership. SMSS was designed to teach top-level execu-

tives and government officials to look beyond short-term profit and to develop alternative approaches to complex business problems beyond the stock theory taught in traditional settings.

Serving as dean and recruiter for SMSS, Farson is also co-founder and president of the Western Behavioral Sciences Institute (WBSI), a think tank also located in La Jolla. The two-year SMSS program is coordinated and run by WBSI.

Using the concept of teleconferencing through each student's personal computer, the SMSS program allows executives across the U.S. and overseas to attend school via a teleconferenced correspondence course through a telephone hookup linking micros supplied by the school to a separate nationwide information network.

In its third semester, the school boasts about 30 students and 15 faculty members around the world. The two-year program costs \$24,800, which includes a Nonlinear System, Inc. Kaypro II personal computer and Gemini 10 printer and consists of four six-month semesters, each based on a different topic.

Under the semester topic title, students are offered the choice of different project conferences and special projects. Professors transmit lectures, assignments and comments; students in turn transmit homework, engage



Richard Farson

in discussion groups and consult with one another.

The nationwide network, the Electronic Information Exchange System, is used to link students together, either for on-line, real-time discussion groups or as a message center. A certificate is presented at the completion of the two-year course.

Students from within the computer industry include Charles House, director of corporate engineering for Hewlett-Packard Co.; Douglas Strain, chairman of Electro Scientific Industries, Inc.; and TRW, Inc. President William Evans.

Shift to 'Strategic Thinking' Aim of SMSS Program

LA JOLLA, Calif. — The unorthodox program at the School of Management and Strategic Studies (SMSS) here is one way of addressing what director Richard Farson perceives as a growing problem for top leadership over the last decade — the need for strategic thinking rather than strategic planning.

Citing a study conducted at Michigan State University, Farson noted that in this decade, five times as many chief executive officers are being fired compared to previous 10-year periods. Based on this data, Farson has concluded that the requirements for top lead-

ers have changed drastically.

In response to these concerns, Farson advocates a "longer" or "systems" view, whereby executives can examine the more remote implications of their actions.

In their efforts to teach the "ability to think counterintuitively against popular myths," Farson and his school have ignored the traditional components of executive management courses — analytic, quantitative, linear or rational skills — for a curriculum based on the humanities and social sciences. Also rejected are grades, exams and the standard teacher/student relationship.

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Cultural Forces More Vital Than Tech: Prof.

By Patricia Keefe

CW Staff

TROY, N.Y. — The rallying cry of the '80s is revitalization through scientific and technological innovations that will provide increased productivity, efficiency and control. But pursuit of this goal to the exclusion of all others will create worse problems than the initial ones.

Moreover, the key to social and economic problems is not technology, but rather the cultural and societal forces behind the application of that technology, Prof. Abbe Mowshowitz, the research director of science and technology at Rensselaer Polytechnic Institute here, said.

It is these cultural forces or attitudes that Mowshowitz seeks to jog. He noted during a recent interview that any mention of the neg-

ative impacts of proposed technology tends to appear as an afterthought, rather than as a legitimate issue of study.

Not a Panacea

This, in turn, along with grandiose visions of an automated utopia, results in the image of technology as a panacea for all problems, he said.

"The arbiters of this new world of computers see the millennium of computopia at hand. Whatever they feel the computer is potentially, they suppose it to be actually," Mowshowitz said.

Part of the problem is the mind set that assumes that something that has worked successfully in the past is the solution for the future. While Mowshowitz does not entirely discount that theory, he stressed the importance of "cultivating tolerance and

flexibility to encourage experimentation and discussion of alternative strategies."

Although fears of displaced workers, data abuse and concentrated control over information resources expressed in the '50s and '60s never came to pass, Mowshowitz cautioned that society is now reaching the point where bigger is no longer better and less is becoming more.

Technology applied in manufacturing decades ago

resulted in increased productivity in wide open markets, creating more jobs in service areas.

Displaced workers had places to go, the professor maintained. But today, technology is being applied on all fronts in an ever-shrinking world with limited market shares.

"There's a distinct possibility there will be no place to absorb [displaced workers]," Mowshowitz maintained.

Jobs created initially by the introduction of new technologies into the work place would level out after a year or so into "jobless growth," the professor predicted.

Instead of accepting unemployment as a natural by-product of increased productivity, Mowshowitz advocates looking at the short- and long-term effects and then deciding whether the costs of progress outweigh the negative impacts.

Primacy of Human Needs

"It is time to reassert the primacy of human needs over industrial production, to act as human beings rather than human resources," he maintained.

Industry always has the option of agreeing to pay a price — be it retraining or creating new jobs — for the benefits of increased productivity, he said.

IMC Elects Officers

WASHINGTON, D.C. — The International Information Management Congress (IMC) has announced the election of officers and directors for 1983.

Frank J. Kohlmeyer, vice-president of Realist, Inc., has been elected chairman of IMC. Kohlmeyer is also a board member of the congress, and is a past vice-chairman of the membership committee.

William J. McGlone Jr., of the 3M Co., was elected president. He is currently president of the National Micrographics Association and has served as cochairman of the past two IMC conferences. John Hensel, also of the 3M Co., was elected vice-chairman; Don Avedon will remain as executive director and chief executive officer; and Michael Rothbart will serve as treasurer.

In addition, the following were appointed to the board of directors: A.P. de Andrade Silva, Frank Brady, D. Gareth Evans, Claude Goulard, Robert Kalthoff, Edward Keating, Jens Lassen, Charles Martin, Michael Timbers, Barry Small, Hugo Stuer, Hiroshi Yokotani and Bert Zaccaria.

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Between Technology, People

Personnel Group Fills Gap

By Katherine Hafner
CW Staff

The management of personnel, involving that most delicate of all resources — people — is a rapidly growing concern for companies large or small, tradition-bound or avant-garde, in a state of expansion or contraction.

The Association of Human Resource Systems Professionals, Inc. (HRSP) is a users group that appears to be filling a gap between systems professionals, on the technical side, and personnel executives, in the middle between the employee and the computer.

"If you took all the users groups for human resource systems and put them together, that's us," Sidney Simon, HRSP's vice-president, maintained.

HRSP was formed in San Francisco in 1978. It started as an informal group of companies that met on an irregular basis to exchange problems and ideas concerning their computer systems.

Word of the group spread, a second chapter was formed in Chicago and today HRSP has chapters in six cities across the nation with 700 members throughout the world.

"By this time next year, the organization will have 1,200 members," Edward Goldmacher, the group's president, predicted.

Most of HRSP's members are "nontechnical" people, described by Simon as "users seeking technical help." And most of them already belong to a users group for a specific vendor.

Demystifying Technology

"We're demystifying the technical aspects of human resource systems, which is what a lot of people who join HRSP are after," Simon pointed out.

HRSP's members attribute the group's unflinching growth to its uniqueness as a users group. "What makes us truly unique is that we're not aligned with any particular vendor," Goldmacher said.

"We offer our members a very broad range of subjects, expertise and educational experiences," he maintained.

HRSP members come from a wide range of companies that use a wide range of personnel and human resource systems, from those who sell large and expensive (up to \$300,000) personnel systems, to "anyone with a personal computer and a few hours to spend writing a personnel management program," Goldmacher said.

Elizabeth Cronin, manager of personnel systems for Levi Strauss and Co. in San Francisco and one of HRSP's founders, fell into personnel systems after she had worked strictly on the nontechnical side of personnel.

"I've definitely become more comfortable with the technical side of things since HRSP was formed," Cronin said.

"There are special groups for every system imaginable," she added. "But ours is the only one that combines the interests of personnel and systems people."

As Cronin sees it, HRSP's function is to bridge the gap and act as a communications vehicle between non-technical people who are specialists in the personnel field and the technical people who serve them.

"Before HRSP was formed, I never knew there were others doing exactly the work I did, encountering the same problems I was encountering," Cronin said.

"The group gives you exposure to how other companies approach problems. I can come back from a meeting with new ideas and applications that have come from the experiences of others," she said.

"We're very careful not to endorse any one vendor or allow them to monopolize the organization in any one way," Cronin said. "They're a great support group, but we invite them in and they abide by our ground rules."

Users Group Keeps Vendors On Their Toes

CHICAGO — The president of Human Resource Systems Professionals, Inc. (HRSP) said that in its relatively short life, the group has become a potent force among human resource systems vendors.

Edward Goldmacher said the five-year-old HRSP has made vendors "take a harder look at marketing rhetoric and cut out some of the nonsense." In his estimation, vendors have become more receptive to the needs of users.

"These days you're seeing more users who are computer literate," Goldmacher said. "Groups like ours tell the vendors what we need, and vendors are finding that if someone has a bad experience with a product, it becomes rapidly known in the marketplace."

Indeed, HRSP's no-strings approach appears to sit well with vendors of personnel management systems.

David Duffield, president of Integral Systems, Inc. in Walnut Creek, Calif., sells a human resource system that includes applicant tracking, division control and data security. He said HRSP "fosters communication with the vendor."

"They want us to build the right product for them," Duffield said. "I call them a proactive group, whereas I'm not sure other organizations are as dynamic in getting things done. HRSP goes after the people helping them solve the problem."

Duffield said HRSP's independence makes the group's advice to other members all the more believable.

"We're interested in HRSP because they are a group of knowledgeable people who can help us provide the right product," Duffield noted. "They have an interest in communicating with us because they want us to provide the solution. It's symbiosis at its best."

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Race Against Japanese Growth

DOD to Offer \$50 Million for Tech Research

By Tom Henkel
CW Staff

WASHINGTON, D.C. — The U.S. Department of Defense (DOD) Defense Advanced Research Projects Agency (Darpa) wants to pump \$50 million into universities and corporations during fiscal year 1984 to develop new computer technologies and help the U.S.

maintain its lead as top technology developer.

However, an even stronger reason for the project may be to combat similar programs that have been launched by Japan's government and Japanese industry. While Darpa contends its Strategic and Survivability Supercomputer project is aimed at prompting techno-

logical developments that may improve U.S. defense systems, a Darpa spokesman noted that the clear target of the program is to beat Japan in developing new technologies.

In fact, the Darpa spokesman made it clear that the Supercomputer project is targeted principally against the Japanese and its Ministry of

International Trade and Industry (Miti), a governmental body that collaborates with Japanese industry and funds private efforts to advance that country's technology.

Miti will reportedly spend about \$500 million over the next 10 years to beat the U.S. as the top computer maker and is also in the process of

developing a so-called fifth-generation computer that will rely heavily on theories of artificial intelligence to operate.

MCC Interested

The project has attracted the attention of a number of sources, including the recently formed Microelectronics and Computer Technology Corp. (MCC), a consortium of computer manufacturers spearheaded by Sperry Corp., Control Data Corp. and Digital Equipment Corp. that have agreed to work together on future technologies.

Although it is still too early to tell, Adm. Bobby Inman, MCC president, noted that it is possible that the group could work with Darpa on some research projects.

At this point, exactly how the Supercomputer program will function remains unclear.

The DOD does not plan on releasing specific details of the program until it makes a formal pitch before Congress, asking for approval of a \$50 million 1984 budget, a DOD spokesman said.

However, Darpa did say that the Supercomputer project will be implemented through its usual channels — namely, donations to universities and research organizations working on technology projects.

The Supercomputer project will be targeted primarily at three specific defense areas: battlefield applications, which include developing intelligent weapons and devices that use artificial intelligence techniques; military planning and advisement; and large-scale simulations.

However, since the project is also concerned with developing systems more powerful than such large-scale processors as Cray Research, Inc.'s Cray 1 and CDC's Cyber 205, the results could also benefit a variety of public and private manufacturers, a Darpa spokesman claimed.



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Science Symposium Probes Fifth Generation's Impact

By Bob Johnson

CW New York Bureau

NEW YORK — What is the future of fifth-generation computers? Will they merely be extensions of the gradual improvements of current technology, or will they be so innovative that they will alleviate today's information processing problems?

These questions were probed by Kazuhiro Fuchi, director of the Icot Research Center of Japan's Institute for New Generation Computer Technology at a recent New York Academy of Sciences symposium on computer culture.

The speaker said recent advances in hardware device technology and the progress in basic research in the various fields of information processing have given rise to a feeling within the industry that innovative fifth-generation computers will indeed emerge in the near future. "In this process of development, such combinations of research efforts have been consistently interrelated. So new computers are being planned to support the entire field of information processing technology," he noted.

In an effort to define an "image" of what these new machines will be, Fuchi said that certain approaches listing the criteria for fifth-generation computers can be used as guidelines. He mentioned several methods that will help in predicting what these new machines will be and what they should do.

"Analyze the needs of information processing and boil down the results to obtain an image of future computers," he said. He added that forecasting what the advancements in device technology will be and studying research results in the various fields of information processing can also be done in order to get a preview of the new systems.

To put the picture in current perspective, Fuchi maintained that, considering technological innovations already witnessed in the industry, various direct and indirect research projects have indicated some improvements and changes that will influence this new era of computers.

Born of Interrelated Needs

"Over the past 10 years, new developments have been made in the various fields of information processing, notably those of basic research. These developments are individually attractive and were first thought to have originated with a singular goal in mind. However, it was learned that they were born out of interrelated needs. These same interdependent efforts have not yet reached the stage for practical application to computer technology, but they inspire the feeling that information processing technology will be integrally reorganized in the near future and that the image of computers themselves will be clarified in this process of reorganization," he said.

The history of computer development has shown that, by and large, improvements have been technological and autonomous, Fuchi noted. Improvements, the speaker said, were not results of interrelated re-

search and did not provide a conducive environment for artificially intelligent fifth-generation machines.

However, Fuchi maintained that research is beginning to be shared in this field. He pointed out that since the early 1970s, mathematical theories of programming have been "groping toward a new computer architecture."

"This progress, along with other similar phenomena allowing relations with other fields, will not only lead to the establishment of an 'image' of fifth-generation computers, but will also give us confidence that these computers will actually be realized," he stated.

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DP 'Hacking' Seen as Addiction to Be Squelched

By Bob Johnson

CW New York Bureau

NEW YORK — "Hacking" — the attempt to gain unauthorized access to a computer system — is a problem that is sure to continue to plague the computer industry, a computer security expert warned here recently.

While hacking has not reached epidemic proportions, it is an addictive process and one that should be met with a comprehensive counterattack, according to Donn B. Parker, senior management systems consultant at SRI International, Inc. Parker was interviewed after a presentation on computer crime sponsored by Anchor Pad International, Inc.

Hacking is an area of special concern to professional DP specialists, considering the increasing number of on-line systems and continual microcomputer integration, he maintained.

In *Fighting Computer Crime*, a book scheduled for release in May by Charles Scribner's & Sons here, Parker maintains that two factors contribute to hacking problems. First, computer technology is introduced to young people in their formative years and provides an increasing supply of addicts. Second, newcomers are encouraged to hack by those already hooked — a familiar practice in any addiction, according to Parker.

The ease with which on-line computer services can be compromised is a blaring encouragement to hackers as well, he noted. Simple access procedures, including similar log-in protocols and simple password and account number assignment practices deliberately designed to be user-friendly and with minimal controls for low cost, combined with a lack of internal system controls, contribute to the problem, Parker said.

Ethical Consideration

Adding an ethical consideration to this problem, Parker noted that hacking has been considered acceptable and, in some cases, encouraged behavior. He asserted that there has not been much of an effort to declare hacking an unacceptable and unlawful practice. Hacking should be done only under strictly controlled circumstances for research and academic reasons, he stressed.

To stem the hacking problem, Parker maintained, a "comprehensive multifront battle to win the war against hacking addiction" must be waged. Potential and existing hackers have to be told that their practices are un-

ethical and illegal. He also suggested that criminal statutes regarding hacking continue to be adopted and that existing statutes be vigorously prosecuted.

In addition, the security expert advised professional societies and computer clubs to adopt and enforce codes of ethical conduct and advised schools to communicate to their students, faculties and employees what is consid-

ered unacceptable behavior regarding computer use.

Public communications clearly stating that hacking is unethical, criminal and unacceptable should be distributed through printed matter and trade journals. In addition, time-sharing and dial-up services must include specific limitations on practices in their manuals, contracts and promotional literature, Parker asserted.

Academia must not reward hacking because it considers it an interesting intellectual feat, the author said. "The fascination with intellectually challenging computer systems that leads to hacking addiction can also be used to divert the attention of potential hackers to positive pursuits. More structured and generally accessible systems that still provide the necessary challenge and

ego-stimulating rewards are good substitutes for beating the systems themselves.

"System hackers will never be eradicated; there will always at least be pranks. But the goal is to make even pranksters understand that their antics are unacceptable, that compromise is too much work, that there is the likelihood of being caught and that levels of punishment are high," Parker stated.



Always Gets Its Man

St. Louis Institutes Computer Crime Division

By Tom Henkel
CW Staff

ST. LOUIS — They don't profess to be computer experts. They don't even have their own computer. But so far, the St. Louis County Police Department's computer fraud squad has always gotten its man.

"We've been lucky," Sgt. Mike Kozuszek, supervisor

of the department's 12-officer Burglary/Computer Fraud Division, noted. Since the computer crime division was formed in January, a total of five cases have been investigated. One of the cases was dropped, and the remaining have either resulted in physical arrests or requests for an arrest warrant. Four cases involving criminal

charges are all pending.

Kozuszek maintained that investigating a computer crime is not very different from investigating any other theft. However, "a lot of companies don't want to report computer crimes," he noted. "It's either because of security reasons or they're embarrassed," Kozuszek said, citing Federal Bureau of

Investigation statistics that only 1% of computer crimes are ever reported and less than half of those are ever investigated by the police.

So far, all but one of the computer fraud squad's cases have involved computer services companies. And all of the cases have involved I/O — thefts of tapes and backup documents or erased or add-

ed data. Suspects in all cases have either been employees of the victimized firm or contract employees hired through a consulting firm, Kozuszek said.

"They [the cases] haven't been that technical," Kozuszek said, adding that all 12 investigators have taken a four- to six-week FBI course on computer crime. Two of the investigators have attended additional police academy seminars on computer fraud to gain more in-depth knowledge of DP systems and operations. At this point, the investigators handle computer crime in addition to other burglary cases. Kozuszek said eventually the department will probably have officers dedicated to working with computer crime.

While Kozuszek admitted the members of the St. Louis computer crime team are not experts, he said the force has access to a variety of expert sources to help with more technical details. For example, the St. Louis County Police Department's own DP department can be used as a resource. Area universities and consultants can also be tapped for their expert information.

"On the average, it takes a couple of weeks to get [a case] wrapped up," Kozuszek said.

The standard procedure for investigating a case involves sitting down with the company president or DP manager and asking them to explain what happened and how the firm's computer system works.

In most cases, since the company has already conducted an internal investigation of the problem, "all we have to do is put together what they have told us," Kozuszek said.

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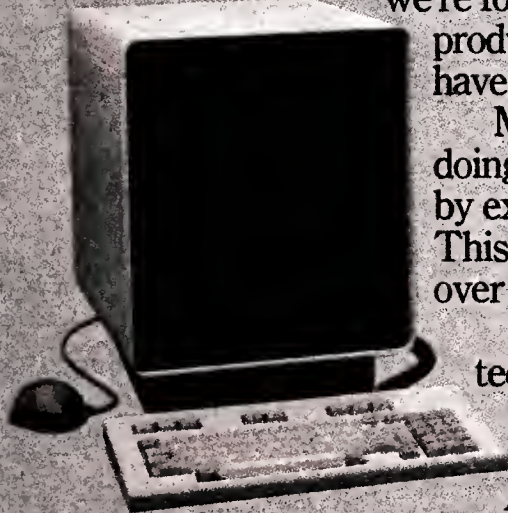
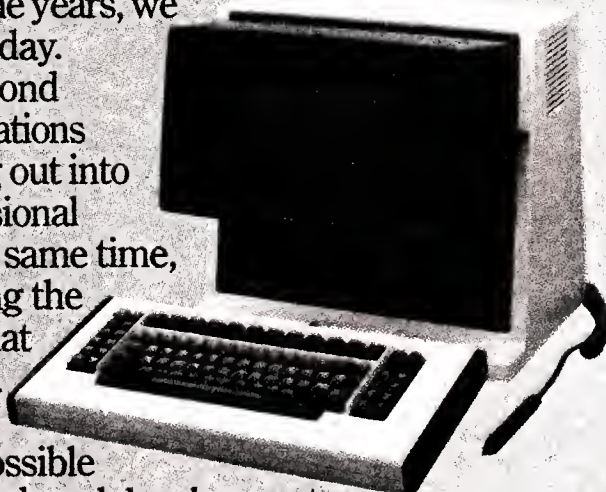
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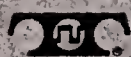
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AIM to Meet Oct. 23-26

HILTON HEAD, S.C. — Facts-83, the annual conference and business show sponsored by the Association of Information Managers (AIM) for Financial Institutions, will be held here Oct. 23-26.

Addressed to financial institutions, the conference will include sessions on commercial checking and micro/minicomputer usage.

The registration fee for the conference is \$250 for AIM members and \$375 for nonmembers. Information is available from Fact-83, Suite 2221, 111 E. Wacker Drive, Chicago, Ill. 60601.

Calendar

Week of May 8

May 9-10, Dallas — **Basic Computer Security Conference.** Contact: American Society for Industrial Security, Education & Seminar Programs Department, Suite 651, 2000 K St. N.W., Washington, D.C. 20006.

May 9-10, New York — **Introduction to the Unix Operating System.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

May 9-11, New York — **DP Project Management: A Practical Approach.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

May 9-11, New York — **Advanced DP Management: Methods and Techniques in the '80s.** Contact:

Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

May 9-11, New York — **Data Communications: An Introduction to Concepts and Systems.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held in Washington, D.C. on May 9-11.

May 9-11, San Francisco — **Information Systems Planning: A Structured Approach.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

May 9-11, Boston — **Distributed Data Base Systems.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

May 9-11, Boston — **Network Troubleshooting.** Contact: Digital Equipment Corp., Educational Services, 12 Crosby Drive, Bedford, Mass. 01730.

May 9-11, Berkeley, Calif. — **VLSI Design.** Contact: Hellman Associates, Inc., 299 California Ave., Palo Alto, Calif. 94306.

May 9-11, Seattle — **Screen Design.** Contact: QED Systems, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181.

May 9-12, Arlington, Texas — **CICS On-Line Applications Design.** Contact: QED Systems, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181.

May 9-13, Teaneck, N.J. — **Systems Analysis Workshop.** Contact:

QED Information Sciences, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181.

May 9-13, Philadelphia — **Systems Design Workshop.** Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181.

May 9-13, Chicago — **13th Conference on Computer Audit, Control and Security.** Contact: Conference Registrar, EDP Auditors Foundation, Inc., 373 S. Schmale Road, Carol Stream, Ill. 60187.

May 9-13, Annapolis, Md. — **How to Establish a Successful DP-User Coordination Function.** Contact: Keston Associates, 11317 Old Club Road, Rockville, Md. 20852.

May 9-13, Hartford, Conn. — **Structured Systems Design/Structured Requirements Definitions.** Contact: Gayle Giesecke, Ken Orr and Associates, Inc., 1725 Gage Blvd., Topeka, Kan. 66604.

May 10-12, Washington, D.C. — **Network Architecture and Protocol Design: A Practical Approach.** Contact: Technology Concepts, Inc., 730 Boston Post Road, Sudbury, Mass. 01776.

May 10-12, New York — **SAS Processing Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

May 10-12, Portland, Ore. — **Northcon/83.** Contact: Lisa Humbert, Communications, Northcon/83, 8110 Airport Blvd., Los Angeles, Calif. 90045.

May 10-13, Chicago — **CICS Application Design.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016.

May 10-13, Boston — **Information Analysis for Decision Makers.** Contact: Management Archtypes Corp., 114 Commonwealth Ave., Concord, Mass. 01742.

May 10-13, Philadelphia — **Computer Network Design and Protocols.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

May 10-13, Boston — **Digital Communications.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

May 10-13, Boston — **Introduction to Unix: A Hands-On Workshop.** Contact: Institute for Advanced Professional Studies, 55 Wheeler St., Cambridge, Mass. 02138.

May 11-13, Pittsburgh, Pa. — **Software Decision Symposium.** Contact: Merlyn Corp., 8075 Roswell Road, Atlanta, Ga. 30328.

May 11-13, Washington, D.C. — **Introduction to Statistical Analysis Systems.** Contact: Registrar, Applied Technology Associates, Inc., Suite 1418, 1710 Goodridge Drive, McLean, Va. 22102.

May 11-13, Chicago — **Data Base Management Systems: Concepts and Guidelines.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

May 11-13, Arlington, Va. — **SAS Basics Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

May 12-13, Washington, D.C. —

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Calendar

Dataplot: A Language for Graphics, Nonlinear Fitting, Data Analysis and Mathematics. Contact: George Washington University, School of Engineering and Applied Science, Washington, D.C. 20052.

May 12-13, Seattle — **How to Evaluate and Select Computer Software.** Contact: Battelle Memorial Institute, Seminars and Studies Program, 4000 N.W. 41st St., P.O. Box C-5395, Seattle, Wash. 98105.

May 12-13, New York — **Data Communications: Advanced Concepts and Network Management.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

May 14-17, Amsterdam, The Netherlands — **The 1984 International Conference on Communications.** Contact: Dr. T. Claasen, Secretary of the Executive Committee, Institute of Electrical and Electronics Engineers, Philips Research Laboratories, P.O. Box 218, 5800 MD Eindhoven, The Netherlands.

Week of May 15

May 15-17, Jamaica — **Caribbean Basin Telecommunications Conference.** Contact: Alice Lynn Booth, Director of Communications, Caribbean Central American Action, Suite 1010, 1333 New Hampshire Ave., N.W., Washington, D.C. 20036.

May 15-20, Philadelphia — **Scholarly Communications Around the World.** Contact: Elizabeth M. Zipf, 1983 International Conference, Biosciences Information Service, 2100 Arch St., Philadelphia, Pa. 19103.

May 16, Columbus, Ohio — **Vsam Foundations.** Contact: Education Coordinator, Goal Systems International, The Goal Systems Building, 5455 N. High St., Columbus, Ohio 43214.

May 16-17, Los Angeles — **Digital PABX.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

May 16-18, New York — **Office Automation: Strategic Planning.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

May 16-18, Chicago — **Structured Testing: Tools and Techniques.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

May 16-18, Chicago — **Microcomputer Systems: A Guide to Selection and Application.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

May 16-18, Denver — **Data Communications: An Introduction to Concepts and Systems.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

May 16-18, Summit, N.J. — **Job Control Language.** Contact: Chubb Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

May 16-18, Chicago — **Data Dictionaries: Concepts, Contents and Uses.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md., 20854.

May 16-18, Summit, N.J. — **MVS Dump Debugging.** Contact: Chubb Training Center, 480 Morris Ave., Summit, N.J. 07901.

May 16-19, Stockholm, Sweden — **International Federation for Information Processing/Security Conference '83.** Contact: Ifip/Sec 83, Stockholm Convention Bureau, Jakobs Torg 3, S-111 52 Stockholm, Sweden.

May 16-20, Ottawa — **1983 Canadian Information Processing Society Conference.** Contact: Session '83, P.O. Box 2577, Station D, Ottawa, Ont. K1P 5W7, Canada.

May 16-20, Boston — **Data Base Concepts and Design.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

May 17-18, Columbus, Ohio — **Vsam Performance & Tuning.** Contact: Education Coordinator, Goal Systems International, Inc., The Goal

Systems Building, 5455 N. High St., Columbus, Ohio 43214.

May 17-19, Orlando, Fla. — **Networking: Design and Implementation of Computer Communications Networks.** Contact: Digital Equipment Corp., Educational Services, 12 Crosby Drive, Bedford, Mass. 01730.

May 17-19, Detroit — **Business Expo.** Contact: Peter Halsey, 15565 Northland Drive, Southfield, Mich. 48075.

May 17-19, Washington, D.C. — **Computer-Assisted Retrieval in Records Management.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

May 17-19, Washington, D.C. — **Federal ADP Procurement.** Contact:

Registrar, National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403.

May 17-19, Boston — **Local-Area Networks: Concepts, Technology and Products.** Contact: Technology Concepts, Inc., 730 Boston Post Road, Sudbury, Mass. 01776.

May 17-20, Mexico City, Mexico — **Computation '83.** Contact: Charles B. Crowley, Project Manager, U.S. Trade Center, Liverpool 31, Mexico 6, D.F.

May 18-20, Dallas — **Financial Information Systems: Current Status and Future Requirements.** Contact: Margaret Markham, Executive Director, Hospital Information Systems Sharing Group, 11800 Sunrise Valley Drive, Reston, Va. 22091.

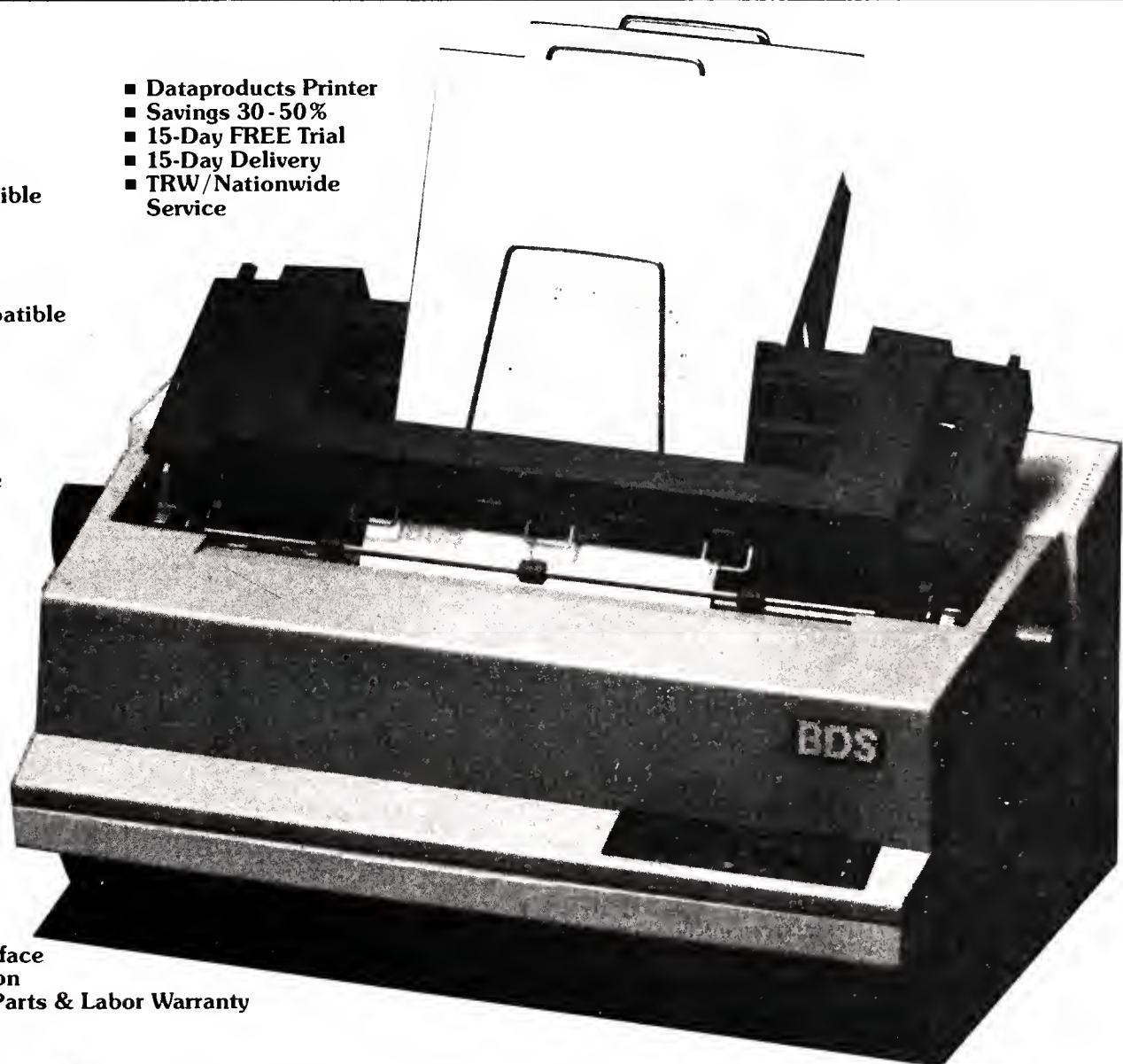
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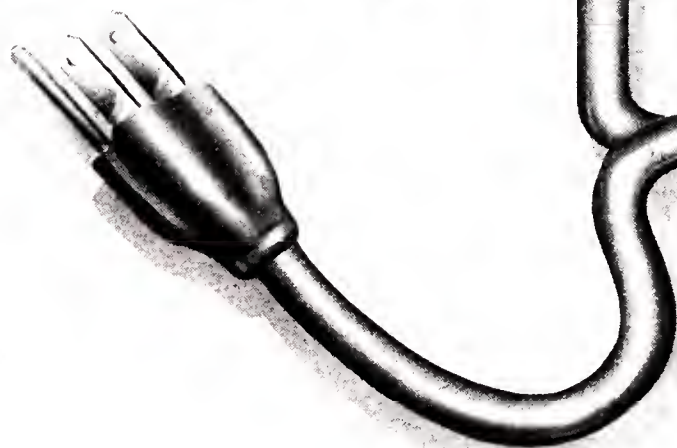
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EDITORIAL

Promises, Promises

Pity the poor beleaguered DP manager. His continual search for "the solution" to the problems that affect all management information systems (MIS) installations sometimes leads him to expect more than a particular technique or concept can deliver. Problems arise when he recognizes the deficiencies after he has already touted the new method as the answer to all of his users' prayers.

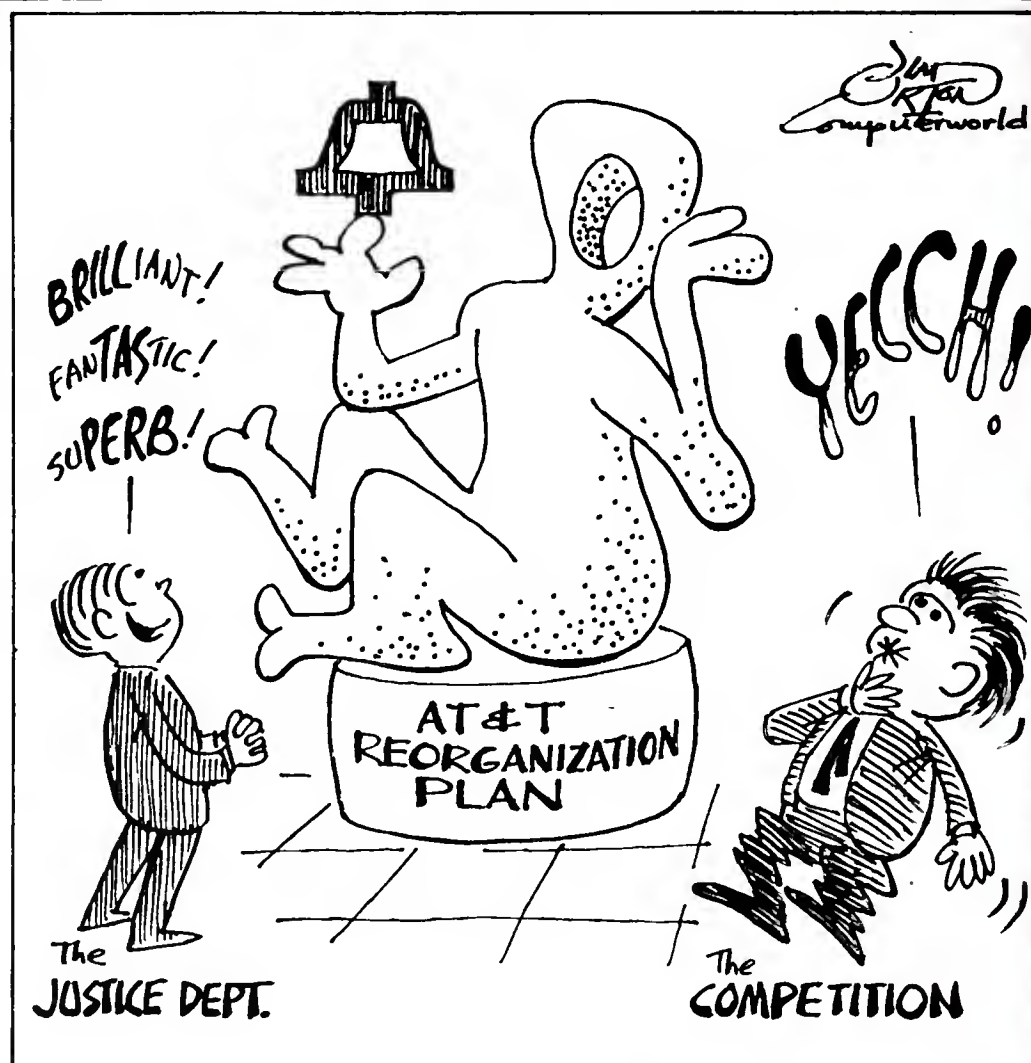
Take the information center concept, for example. IBM coined the term several years ago to stand for a facility that operates between DP and end users and provides the latter with the training they need in order to handle some smaller programming requests themselves. Ever since then, DP and MIS managers have embraced this as the means to eliminate their growing applications backlog. Since end users go to the information center to learn themselves how to handle their one-time reports or minor changes to existing programs, it was felt that their backlog of requests to DP would diminish.

This promise of the information center, unfortunately, has not yet been realized. A recent study of information centers by International Data Corp. found that "The reduction in backlog is at best a case of robbing Peter to pay Paul." As end users become more knowledgeable about the capabilities of computer systems, their requests become more complex. Eventually, the programs they want to develop can no longer be handled via the information center, and they return to the production-oriented DP shop for help. "The services end users require will soon match in dollars and people any savings from backlogs," the report stated.

According to a recent *Computerworld* mail survey, the biggest headache reported by more than half of the 411 respondents is the applications backlog. Information centers still are relatively new in most installations, so it may be too soon to measure their effects on the applications backlog. But it may also be the case that the uncovering of the "invisible backlog" of new requests is eroding this presumed benefit of the information center.

Perhaps the problem is that the information center is seen too much as an ultimate solution. Perhaps a more realistic approach would be to regard it as only one of a number of tools that can be used to improve the efficiency of the MIS organization. There are a variety of productivity tools available to stretch DP resources, such as structured programming and reusable code. Prototyping is another tool designed to walk end users through a system development process from the earliest stages so the DP manager does not learn at the 12th hour that the nearly completed system does not meet his users' specifications. Perhaps used in conjunction with these and other techniques, the information center can solve a sizable portion of the problems facing DP managers.

The typical data processing installation is too complex and essential to the overall workings of an organization to attempt to meet its goals by jumping on the bandwagon when new techniques emerge and throwing out existing processes. A more careful and reasoned approach that would involve examining new technologies in light of existing ones seems to be in order. At the very least, it would avoid the embarrassment of having to admit that the concept that was thought to be the solution is not really addressing the whole problem.



In the Eye of the Beholder

LETTERS

Times Have Changed

There was a time when the U.S. government led the way in the development of computer standards.

But times have changed. Large corporations have diversified and are less dependent on their share of (and, thus, less influenced by) U.S. government computer business.

In addition, the Reagan administration has considerably weakened the bureaucracy in its effort to streamline and reduce the size of government. This results in a less aggressive pursuit of high government standards.

In the absence (or reduction) of government influence on the free marketplace, we must now look to private corporations to carry their portions of the responsibility for the common good.

Jerome Garfunkel
Jerome Garfunkel Associates, Inc.
Lakeside, Conn.

People Systems

I agree with Gordon S. Glasgow's letter, "Meeting Halfway" [CW, March 28], regarding programmer extinction. Good programmers who approach problems logically, methodically and thoroughly will always be in demand. But this demand does not stem from the absence of these qualities among users. Rather, it stems from the fact that the design of computers is based strictly upon a very simple logic.

People systems, on the other hand, are based upon the interaction of extremely complex organisms. When people use computers, or for that matter any other tools, they will constantly find conflict between the relative simplicity and limitations of the tool and their own highly complex needs.

Computer systems are the most

complex tools people use. Just as the ordinary man in the street has a certain capability for cobbling together any hardware tool he requires, so may he cobble together the program he needs. Just as the hardware tools I cobble together frequently fail, so will the ordinary man's programs fail.

John McNellis

Humphrey Products
Kalamazoo, Mich.

Rosy New World?

Charles P. Lecht's article, "A Robot for Baby, a Hologram for Dad" [CW, March 21], contained several dubious assertions of fact. Specifically, Lecht argues that "It should not be too long before each baby has at least one robot within a year of birth and everyone older, more than one." He regards those who doubt the wisdom of such "vehicles... to alter our perception of reality" as being either "skeptics, cynics or Luddites."

While I claim neither of the three titles proffered, I do have serious objections to Lecht's rosy new world. Specifically, the description of the baby referred to above should be qualified to include only "each Western European or American baby born of quite prosperous parents who have an excess of disposable income."

In the world as it exists, the robot will not be the great amplifier that Lecht foresees. Rather, it will merely serve as a further indication of the vast gap between the "haves" and the "have nots." The revolution brought on by the automobile has been with us now for the better part of a century and it is certainly not true that every baby grows up and has access to one.

Terry A. Ward
University of Northern Iowa
Cedar Falls, Iowa

LECHT ON SCIENCE /Charles P. Lecht

Introducing the Office of the Past

It's about time someone said it: No one knows what the office of the future is or even what it means. Nothing more than an inspiring totem of the great-leap-forward variety, its advocates find it useful as a catch basin for half-formed aspirations in the mix of which they hope to find material wherewith to patch the holes limned by their ignorance of its meaning.

As real in our mind's eye as a great shape made concrete by the magical hands of pantomimist Marcel Marceau, yielding up its secrets with the garrulousness of the Sphinx, the only thing we really seem to know about the office of the future is that it's coming — although it will never actually arrive, whatever it is.

With the obvious exception of improvements in the quality of its artifacts, our concept of the office has been unusually resistant to change of any fundamental kind. Once reliable sources of heat and light were installed and electricity flowed freely into it, the office seems to have become frozen in time, all the preaching to the contrary notwithstanding. It remains so true to its original form that we are moved to conjecture the existence of a mysterious, Pavlovian conditioning at work within us that impels us toward the same solution to our problem of creating work times, places and activities, no matter what technology we call upon to assist us.

Not that some improvements (for example, less pain in performance) are not achievable: But I am beginning to doubt seriously that anything momentous can occur to alter our present vision of the office that will lead to its betterment unless we

This is the first article of a two-part series on the office of the future.

make some very basic changes in the formulas we use in persuading ourselves to work in it in the first place.

Kernel of the Issue

These changes address the very kernel of the issue, since the most significant improvements to our work spaces shall emerge in direct proportion to our ability to clarify how we envision the jobs of the future that we'll be performing in them.

That this will lead to material improvements in the quality of our larger lives seems inarguable to me; as does the urgency of getting on with it. For it is my opinion that contributing to a pervading sense of social malaise in our times is the conviction held by the overwhelming majority of us that working (as we currently know it) is more unpleasant than not. Most of the time our jobs seem to deliver us to places we'd rather not be at times we'd much sooner not be there to do what we do not want to do.

I'm not claiming that it should or need be that way, but only that it is. Clearly, if we can do anything at all to ameliorate this unfortunate situation, we will be far better off.

So we must get on with reevaluating old formulations of when, where, what and how. The rewards could be enormous, and our office of the future would finally begin to reveal itself.

If this is not done and new conclu-

sions are not reached, the most promising, innovative ideas we have for upgrading our offices and their role as housing for our work can result in little more than reproducing those offices after having subjected them to essentially cosmetic rearrangement or replacement procedures. For our present offices, as they were conceived at the dawning of the Industrial Revolution, are just now attaining the perfection of conformity with their missions of that day.

Looking Back

And what were the salient features for glaring absences of that day, looking back from our current vantage point? There were no telephones, cars, elevators, radio, TV, flight, electricity or computers — in fact, none of today's commonplaces.

Our work rules were totally different. There were few of what you could call international companies. Literacy was not nearly universal, even in work environments. Participatory management was still a dream waiting to be dreamed. Spitoons made their brass gestures to the ideal of sanitation in the office, while eyeshades graced the clerk's brow as he reached with his quill for the inkpot on his high desk.

Should we be surprised that no matter what we do to improve our offices, the pressures generated within them are hardly alleviated?

In some cases, in fact, they seem to increase without warning, as is not infrequently the case when new communications conduits are opened. When this occurs, it waters the roots from which spring our larger fears of technological slavery — as

though we truly believed that machines could actually take over one day, enveloping our lives by pandering to our greatest weaknesses, like the passion for beating last year's record or for being first in anything.

Substantive Improvement

Because of this, the continuous refinements that offices have undergone have long since exhausted our available options for substantive (as opposed to the earlier mentioned cosmetic) improvement. So what? This is not the first time something like this has come about. Consider the horseshoe, the lightning rod, even the Chinese junk (this last perhaps an example of the most enduring ancient office).

As art reflects our emotions and war our anger, our current offices faithfully reproduce our concept of the where, when, what and how of work in the latter half of the 19th century. As long as these remain unchanged, our dreams of an office of the future are made to disappear.

Fortunately, our latest technological achievements give us hope that changes in the where, when, what and how of work are at least possible. Networked terminals linked to our emerging integrated services digital technologies are reducing the importance of location as a factor in office of the future creation. And with this, at least, the when element of work, which creates a need to assemble workers conveniently, is also diminishing in importance. How could it do otherwise when timing considerations (for example, for discourse) now are modulated by the ability to seek out and find a person in his

(Continued on Page 39)

HUMAN CONNECTION /Jack Stone†

Some Simple Ideas for Overcoming User Fears

There is no question that the vast majority of first-time users in the business setting are apprehensive when they begin computer training, but the plain fact is that an experienced instructor should be able to move them quickly beyond their fears and into the learning environment — at least this has been my experience.

It turns out that user concerns, though real, are relatively mild and routinely dissipate within a few hours, assuming that commonsense actions to counter them are taken at the start.

Here are some ideas that have been helpful to me. If the actions listed here seem simplistic, it's because they are:

- Each class, whether composed of executives or clerks, receives hands-on training that is lock-stepped to my direction and employs simulated "live" data and systems that are in service within the organization.

This basic strategy has been so successful for me in overcoming routine mental blocks to user learning

This is the sixth article in a series, "DPers and the Psycho-Computer Syndrome," coauthored with Joanne Barker.

that I cannot imagine training any other way.

Immediately after kickoff, we have an hour or so of game playing, not only to break the ice, but also to introduce elementary computer concepts.

Discovering that computing can be fun is very effective in dissipating worries quickly.

- User professionals — managers, supervisors and technical specialists — are most vocal about their concerns with computers. However, their issue is not with the technology or applications base, but instead with policy and organizational matters, like capabilities of DPers to deliver agreed-upon systems designs and follow-through support. Such users allege years of suffering with systems failures and are resentful at having "yet another loser dumped in

their laps."

I, as a consultant instructor, cannot very well avoid this subject, but I can sidestep it: I bring in the firm's highest ranking DPer at kickoff time to provide a status update on major systems and explain away issues.

Typically, I've found that few attendees have ever met a DP manager. When they discover that DPers are indeed humans who face problems similar to theirs, the user-emotions are quieted — for the duration of the class, anyway.

- One worry of possibly 80% to 90% of user nonprofessionals — clerical, technical and administrative personnel — is the loss of data or text through keying error and having to waste considerable time in reentering information. (I should note that these feelings do not seem to spill over to concerns about potential criticism from their supervisors for such mistakes.)

But after users are introduced to terminal functions dealing with permanent storage and recovery, the worry generally attenuates and, sometimes, evaporates.

A minority of these users, perhaps 30% to 40%, fret about possibilities of causing mechanical damage to the keyboard, perhaps stemming from the wreckage inflicted on their home video game joysticks.

However, a few minutes of keyboard exercises plus gentle admonitions against spilling coffee and cokes into the terminal seems to dissolve the issue.

About the same number of users wonder about the impact of automation on their jobs. This question is resolved when they see for themselves how the machinery can improve the quality and quantity of their work and add to their marketable skills.

Those few who are frightened of tests and instructor evaluations for their supervisors are quickly relieved to learn that there are none.

I have found that a traditional approach, rather than a psychological one, to technology training and the resolution of new user fears works just fine.

Letters to Stone should be addressed to him at Box 270, 1377 K St. N.W. Washington, D.C. 20005.

THE DATA CENTER

Some Questions Answered About Practicality

My article, "Information Centers Demand MIS Attention" [CW, Nov. 29], caused people to raise several questions about the practical aspects of developing an information center. I have made a number of presentations to various professional groups over the past year on the subject of the information center, and the same questions are often raised at those sessions as well.

I am absolutely convinced of the importance and effectiveness of the information center approach and I hope that by answering the following list of questions I may encourage other people to begin the process of

'As the use of the information center grows, and as the benefits that can be derived from the use of the information center facilities become understood within the organization, the willingness of MIS clients to devote the time and interest to the effort will grow accordingly.'

installing such a function:

- Can tangible results be achieved? Can the expense associated with interactive processing, or in-house time-sharing (which is what the information center really is), be

cost justified? Will those outside the management information systems (MIS) department be willing to accept responsibility for writing their own programs and developing their own applications? Can the use of an

information center provide an effective alternative to the introduction and use of microprocessors?

While the answer, at least from my experience, to all of the above questions is "yes," a somewhat more detailed look at each specific question may prove helpful to those considering movement to an information center environment.

Generally, it can be said that provided sufficient senior management support and MIS guidance, control and commitment are available on an ongoing basis, the information center concept can prove to be an extremely effective tool.

It not only will expand the benefits of the MIS function within the organization but, properly managed, it will improve the MIS image. Surely anything that improves the typical MIS image must be considered laudable.

- Can tangible results be achieved?

Even in the rather prosaic areas, such as the automation of clerical accounting spreadsheet functions, dramatic savings in time can be realized. It is not at all unusual to see eight or 10 hours of clerical effort reduced to one-half hour or less. When applications advance to the forecasting and modeling stages, the potential savings, based upon the ability to determine the consequences of actions prior to investing considerable sums of time and money, can be significant.

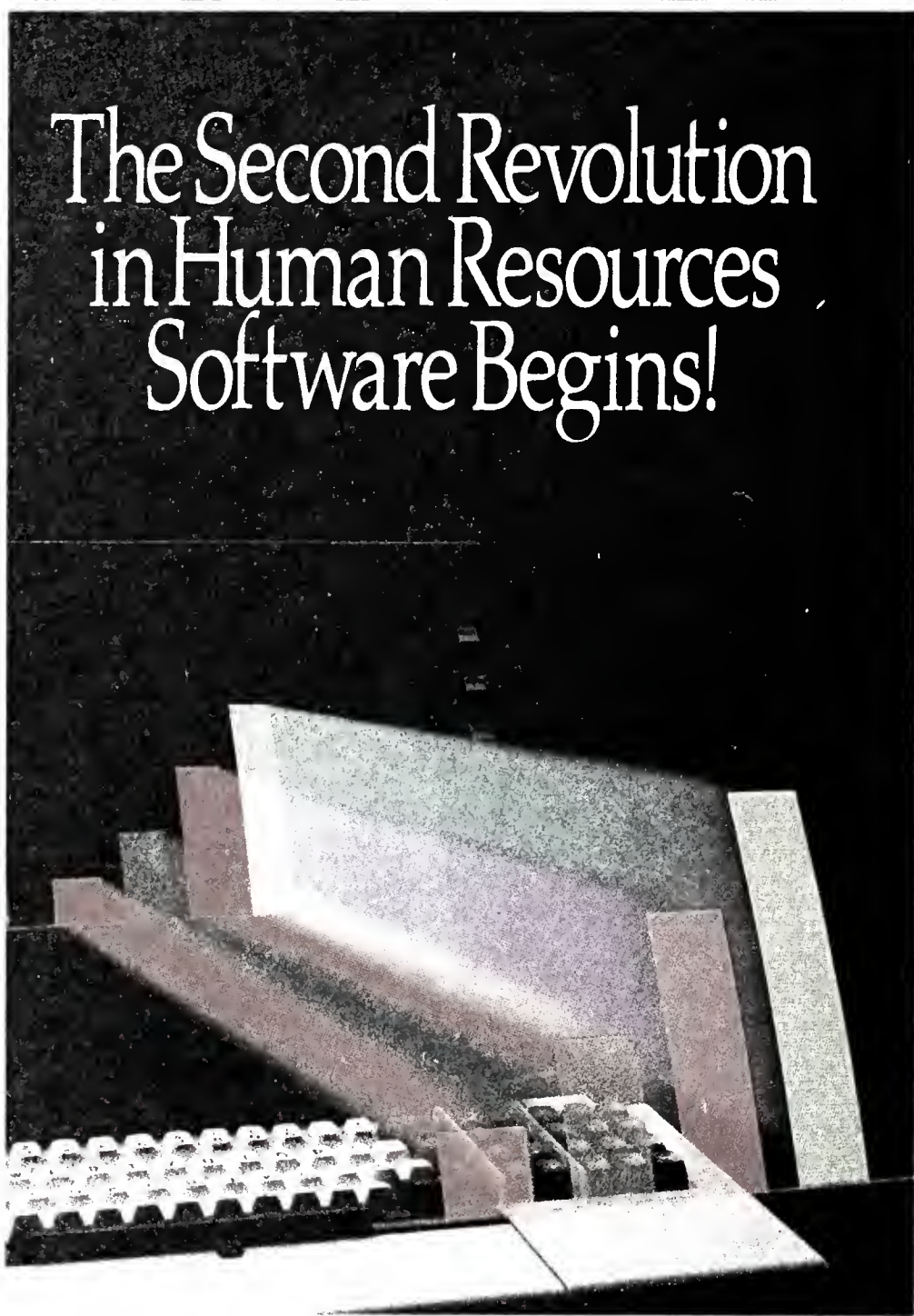
- Can the expense associated with interactive processing, or in-house time-sharing, be cost justified?

In my experience, the savings in clerical expense that has been saved through the use of the information center more than pays for the cost of the process.

Because this is the case, the savings generated in those areas where the real payoff occurs (forecasting, modeling and more accurate, timely data with which to make better informed decisions) can be considered to represent a dividend on the information center investment. This dividend can be considerable.

- Will those outside the MIS department be willing to accept the responsibility for writing their own programs and developing their own applications?

As the use of the information center grows, and as the benefits that



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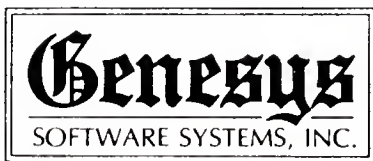
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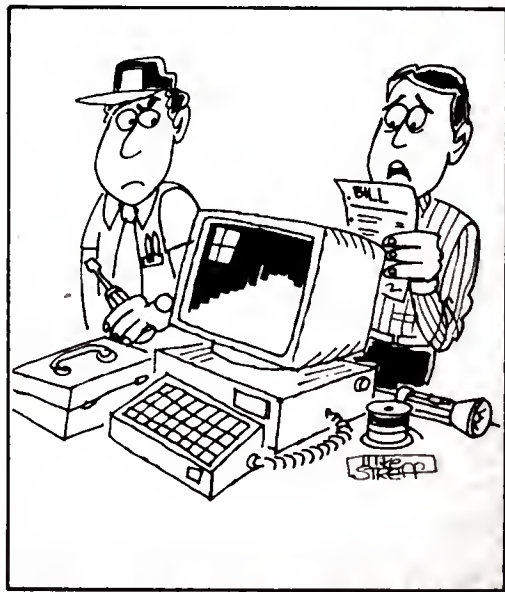
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John P. Murray†

Of Adopting an Information Center Approach

can be derived from the use of the information center facilities become understood within the organization, the willingness of MIS clients to devote the time and interest to the effort will grow accordingly.

While it will be somewhat difficult in the beginning to raise a sufficient level of enthusiasm for the concept of the information center (we all resist change), once the first projects have been successfully completed and the results can be seen, others will want to adopt the new methods.

Once clients are convinced that they can do more with less effort, that they can obtain answers they require without heavy MIS involvement, they will embrace the information center concept.

In fact, it has been my experience that once an information center is established, the demand for the service grows at a very rapid pace. If the approach is sound, the MIS department will very soon discover it is in a sell-

er's market, with more requests to become active in the center than can be comfortably handled.

• Can the use of an information center provide an effective alternative to the introduction and use of microprocessors?

The information center offers a number of benefits that cannot be found in the use of microprocessors, namely, greater processing power, availability of already-captured data, control of the organization's data and so on.

Therefore, given a choice and having a clear understanding of the advantages of both the microprocessor

and the information center, the information center is not only a practical alternative — it is often a more desirable choice.

Microprocessor's Place

This should not be taken to imply that microprocessors should be banned in the organization. They may have quite appropriate functions in an organization, and in cases in which they can be tied into the organization's mainframe, they may offer the ultimate information center concept.

However, I believe much of the cause of the installation of micro-

processors has been as a result of the failure of MIS to offer an appropriate alternative such as the information center.

Organizations are finding out that the low cost and ease of operation of microprocessors also carry inherent problems.

I must confess that I am an information center bigot. But this is only because properly managed, it works.

Murray is director of MIS for Ray-O-Vac Corp., Madison, Wis. He is responsible for worldwide MIS activities. Murray has 21 years of DP experience, 10 of which have been devoted to the management of data centers.

The Office Of the Past

(Continued from Page 37)

home or automobile?

The how of work is undergoing the fastest and most radical positive change. One need only consider the effect of the word processor on office productivity, the beeper on communications, the portable telephone on geographical freedom and the computer on intelligence (virtual or real); the number of innovations on the how list make it far and away the longest. There is hardly a week in which *Computerworld* does not announce some new how breakthrough, price reduction, performance improvements to devices that aid us in the discharge of office duties and so on.

Main Obstacle

It is the what of work that concerns me, for it seems most resistant to change and, thus, appears as the main obstacle blocking the emergence of the bona fide office of the future. Even the negative consequences of working hard and for interminable periods under bad conditions should be susceptible to alleviation by the what of it all: better up to our chins in flowers than up to our elbows in fertilizer.

I think we've got to be supercreative to remove this obstacle. For it strikes at the very heart of the issue of what in the world our future executives anticipate doing.

From mailroom chief to chief executive officer, roles are changing; new opportunities are created as today's data processing/communications environments relieve us of work ranging from the purely physical (dockworker) to the semiphysical (mail carrier) to work involving minimal, but still important, physical requirements (the traveling executive).

Lecht is president of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.



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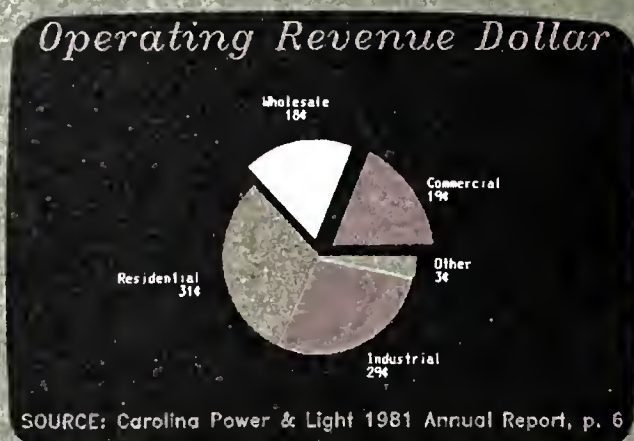


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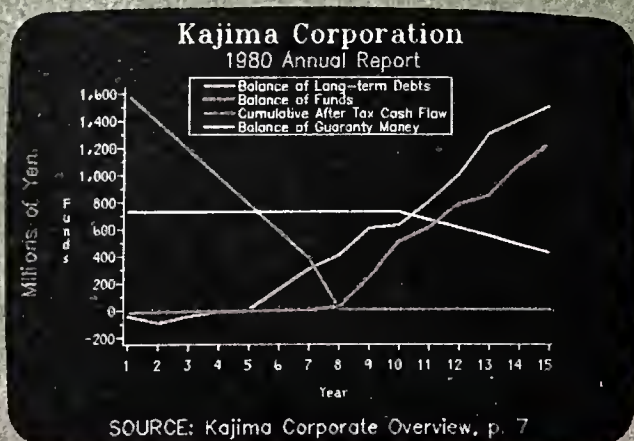
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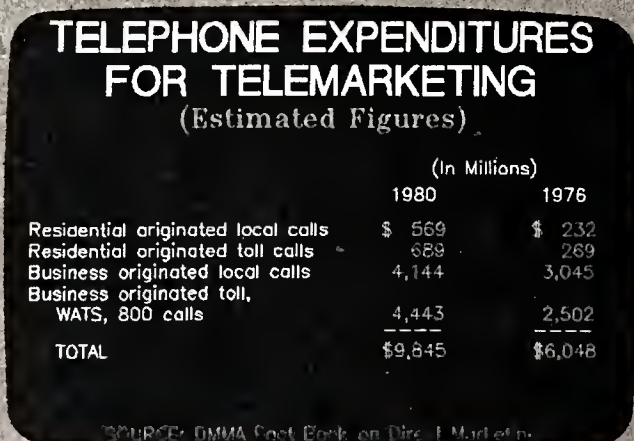
Choropleth Map of Products



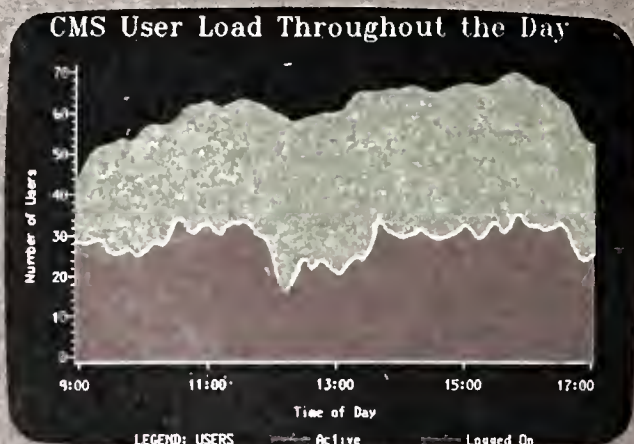
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Plot of Funds*Year



Telephone Expenditures



Plot of Load*Time

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Feature System Transportability

DBMS and Applications Packages Debut

By Bob Johnson

CW New York Bureau

NEW YORK — Computer Associates International, Inc., (CAI) — a utilities software firm — entered into new arenas last week with the introduction here of a relational data base management system (DBMS) and two on-line applications packages. All three packages are designed to be transported across different vendor hardware lines, including mainframes, minicomputers and microcomputers.

The DBMS, called CA-Universe, was developed in the C programming language and currently runs on IBM DOS, OS and VM systems. It has a command language capability within Cobol, PL/I or assembler and

an interactive screen-mapping facility that uses a menu-based, cursor-controlled editor, CAI said. It also offers an integrated data dictionary that updates and maintains information on the attributes describing the data base, including information on the relations, tuples and

domains, according to CAI.

CA-Universe automatically retrieves data contained in conventional IBM Isam, Vsam, DL/1 or IMS files by using an integrated information retrieval component, the company noted. The DBMS also offers end-user query languages, free-form

report writers, a full screen editor for command language processing, access security at the data base, relation and data levels, on-line and batch retrieval facilities and a fully recoverable backup/restore and audit facility.

Although the product currently runs on IBM systems, CAI said that CA-Universe will eventually be usable in any operating system environment. The company maintained that, unlike a DBMS link that is an interface for the movement of data from one environment to another, its DBMS will be usable with mainframes, minicomputers and microcomputers from nearly every vendor including IBM, Digital Equipment Corp., Data General Corp. and Apple Computer, Inc. CAI noted that several components of the product are already available to run under Bell Laboratories' Unix operating system.

Also announced last week by CAI was a financial management software series applications package and a distribution management software series applications package under the title of Advanced Business Software.

The on-line financial pack-
(Continued on Page 44)

Command Processors Out For Vtam Printer System

DALLAS — Levi, Ray & Shoup, Inc. has announced two command processors under IBM TSO and CICS to support its Vtam Printer Support (VPS) system. — also known as JES/3270 Remote Job Entry.

The full screen command interfaces offer end users a resource to control print activity on local and remote IBM 3260 and 3280 series printers, the company said.

Users can check on jobs waiting to be printed, start and stop printers, reposition printers backward or forward by pages or lines and restart or cancel print data sets. Other commands set the printers to accept special forms and forms control buffers, alter current JES selection criteria, display current printer activity, display Vtam/Tcam printer status, display a printer's audit trail of completed print and authorize a printer

to accept large-volume reports, the vendor said.

The TSO interface is available at no charge to VPS users. The CICS interface option licenses for \$1,200 from the vendor through P.O. Box 18538, Dallas, Texas 75218.

ment system for IBM CICS and non-CICS environments. The products are available for IBM OS and DOS environments.

At the same time, the company announced enhancements to its library control systems (LCS) line with the release of Version 5.0 of Panexec OS. The enhancements are said to be a positioning release for future support of IBM's MVS/XA architecture in 370 compatibility mode.

Major Features

Major features supported by the Panvalet/O-W-L integration are:

- Dynamic recall, which maintains multiple levels of re-
- (Continued on Page 44)

Maintenance Firm Goes In-House

Financial System Speeds Processing

DALLAS — When Pritchard Services, Inc. (PSI) gave finance manager Weldon J. Montgomery the go-ahead to develop an in-house financial management information system, he went about his search armed with a shopping list.

Montgomery's year-long study resulted in the decision to develop an in-house system with hardware and software that would serve all three legal

entities in the U.S. and Canada, encompassing about 90 profit and loss statements at multiple levels of consolidation.

Pritchard provides cleaning and security services, mechanical maintenance, pest control, window cleaning, grounds keeping and landscaping and building management for a variety of facilities. Previously the company used outside service bureaus to provide its finan-

cial reports and statements. The bureaus eventually proved expensive, and the turnaround time was slow, Montgomery said.

His study to find an alternative system encompassed nearly every financial information requirement of the firm, Montgomery said. The first phase examined the information available to management and how it

(Continued on Page 46)

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Transport Service Announced

LOS ANGELES — Resource Delivery Corp. has announced a service that reportedly accomplishes data transport between normally incompatible systems.

Automated Data and Program Transport (Adapt) allows data and program file transport regardless of hardware or operating system. Adapt reformats data obtained through a dial-up connection and transmits it according to customer specifications.

It is available as a complete transport method or as a custom service. Costs average about \$1,500 for the first 1M byte and \$500 for each 1M byte thereafter, the spokesman said from 203 S. Norton Ave., Los Angeles, Calif. 90004.

IBM JCL Sysout Storage System Unveiled

OAK BROOK, Ill. — Applied Information Development, Inc. (AID) has unveiled an IBM JCL sysout storage system that it claimed will cut paper costs and speed retrieval.

The software, called JCLWTR reportedly coordinates on-line and computer output microfilm (COM)

access to JCL listings for production jobs run in MVS shops.

Features include: elimination of printing, bursting and filing of production JCL listings; microfiche archival; a master index, accessible through the TSO/system productivity facility; support for Datagraphix,

Inc. Microcom and Kodak Corp. Komstar interface to COM.

JCLWTR is available for a one-time license fee of \$5,000, a vendor spokesman said.

A 30-day trial period is offered from AID, 823 Commerce Drive, Oak Brook, Ill. 60521.

'Bimswap' Links IBM 3270s to CICS/VS

MINNEAPOLIS — B.I. Moyle Associates, Inc. (BIM) has introduced software that is said to permit local IBM 3270 CRT terminals and printers operating under Btarn to be switched dynamically between multiple CICS/VS partitions in a CPU as needed. The package operates under IBM DOS/VSE and CICS/VS envi-

ronments, the vendor said.

Bimswap reportedly eliminates the need for duplicates of control unit ports, cables and/or mechanical switches. A typical use is to detach a terminal from a production CICS partition and then reattach the terminal following the completion of the test.

Bimswap is available for a purchase price of \$1,500. It can be leased for \$750/year or \$75/mo from the firm at 4355 Lyndale Ave. S., Minneapolis, Minn. 55409.

'Datavantage' Gets Price Hike

FORT LEE, N.J. — On-Line Software International, Inc. has announced a price increase for Datavantage, an IBM IMS productivity aid for creating and managing test data base environments.

The price of Datavantage will increase to \$25,000 on June 1, a spokeswoman said. Prior to that date, the price will be \$20,000.

Datavantage reportedly ensures that all possible combinations of data are included in the test data base so the application on trial encounters every situation found in production.

Datavantage also offers an expanded String operand that allows users to scan a DL/I data base using search criteria for specific fields within a segment. The system saves and restores multiple copies of the test data base in one central location.

The company is located at Fort Lee Executive Park, 2 Executive Drive, Fort Lee, N.J. 07042.

Phycom Service Introduced

VIENNA, Va. — GTE Telenet Communications Corp. and Fisher Stevens, Inc. have introduced an interactive pharmaceutical data base service via GTE Telenet's Minet medical information network.

Scheduled to be available by early next year, Physicians Communication Service (Phycom) will contain product information on drugs and preparations marketed by major U.S. pharmaceutical companies. Physicians will access Phycom through data terminals or microcomputers with modems.

Phycom will also feature news bulletins supplied by the Bureau of National Affairs, Fisher Stevens' parent company.

The initial charter subscription pharmaceutical companies are Ayerst International, Inc., Burroughs Wellcome Co., Lederle Laboratories, Smith Kline & French Laboratories and USV Laboratories.

The Phycom service will be free of charge to physicians who subscribe to GTE Telenet's Minet Service. The Minet service subscription fee is \$100; hourly fees for the available services range from \$25 to \$27.

More information is available from the vendor at 8229 Boone Blvd., Vienna, Va. 22180.

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SOFTWARE WALK THROUGH

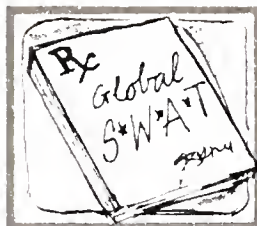
A prescription for immediate relief from the EOTF syndrome



These are trying times for those who are involved in evaluating financial software. There are lots of products and lots of claims as to how easy each product is to install and to use and how well each system meets individual requirements. The prospective buyer has got to be apprehensive since his decision is irrevocable. Once money has changed hands the product must be installed regardless of whether or not expectations have been met or the vendors obligations have been fulfilled or regardless of the time it takes in-house staff to install it. In medical terms this anxiety neurosis is called the EOTF (egg on the face) syndrome, characterized by profuse sweating and spastic twitches in the right shoulder.



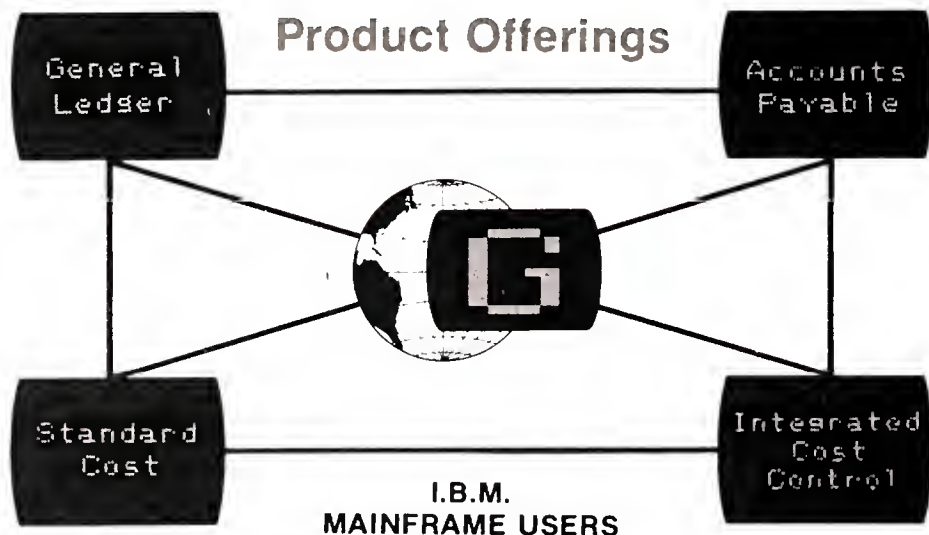
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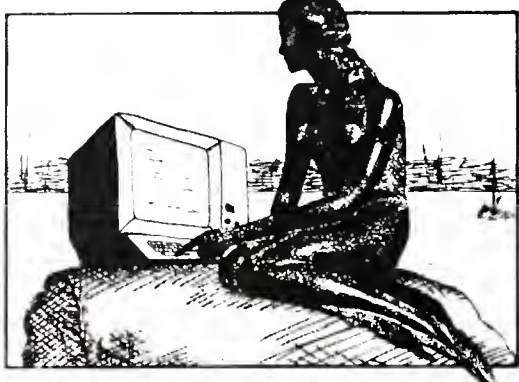
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Panvalet, O-W-L Integrated, Panexec OS Version 5.0 Out

(Continued from Page 41)

vision for the immediate reconstruction of source programs.

- Concurrent access protection in O-W-L, preventing multiple programmers from modifying a single source program by alerting each programmer of others' activity on that program.

- Level stamping, which maintains a historical tracking system of line-by-line source changes.

- Include processing, which extends the copybook philosophy to the O-W-L on-line environment with cross-referencing capability.

- Generic security, allowing users to set up a hierarchical approach to security access.

- Production member integrity, which extends to O-W-L's on-line environment and provides protection of the production program from modification if the programmer fails to supply the proper change control procedure.

- Comment records carried into the O-W-L system for use in identifying the functions of a program.

Panvalet and Panvalet/On-Line users may upgrade to O-W-L or LCS O-W-L without conversions, a spokesman said. The integrated package is scheduled for release under DOS/VSE on May 1, with OS/VS1 and MVS versions scheduled to follow. O-W-L is priced at \$20,000 for DOS and \$27,000 for OS.

The new version of Panexec includes a user-controlled security exit capability for OS/MVS, which is said to allow Panexec and the user's in-

stallation security package to communicate. Support for CICS programs is offered, the spokesman said, allowing the storage and execution of CICS programs that are located in the processor programming table to be loaded from a Panexec library.

The base price for Panexec OS is \$30,000. Pansophic is located at 709 Enterprise Drive, Oak Brook, Ill. 60521.

Pulse User Group Adopts Regions

OAK BROOK, Ill. — Pansophic Systems, Inc. has enhanced its Pansophic Users Learning and Sharing Exchange (Pulse) user group program through the adoption of a regional conference program, the company announced.

Pansophic will sponsor regional Pulse conferences to be held twice yearly in each of eight regions around the U.S. The regional conferences will replace the single national Pulse conference that was held annually.

Each regional Pulse conference will include a two-day program consisting of at least 30 product sessions and presentations by company executives. The first three regional conferences are scheduled for May 15-17 in Hot Springs, Va. (Mid-Atlantic region), June 1-3 in Atlanta (Southeast region) and June 8-10 in Lake Geneva, Wis. (Midwest region). The registration fee is \$195.

Pansophic is located at 709 Enterprise Drive, Oak Brook, Ill. 60521.

Packages Feature Transportability

(Continued from Page 41)

age runs on IBM and DG computers and includes general ledger, payables and receivables, interactive budgeting, advanced forecasting and modeling and customized financial reporting, according to CAI.

The distribution management series of software runs under the IBM DOS and OS operating systems and under the DG AOS, AOS/VS and Rdos operating systems, CAI said. The package includes inventory control, order entry, sales analysis, accounts payable and accounts receivable.

Like the company's CA-Universe DBMS, the Advanced Business Software will eventually be able to run on nearly every vendor's equipment, including minicomputers and microcomputers, by means of an integrated runtime program, CAI maintained.

Pricing for the CA-Universe DBMS is \$85,000. Prices for the Advanced Business Software packages range between \$80,000 and \$85,000 for the financial series, depending on applications, and between \$70,000 and \$85,000 for the distribution package. More information is available from CAI, 125 Jericho Tnpk., Jericho, New York, 11753.

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HP 1000 System Gets Enhanced

PALO ALTO, Calif. — Hewlett-Packard Co. has announced that its HP 1000 technical computers can now communicate with IBM or plug-compatible systems via multileaving remote job entry (MRJE) in HP's Distributed Systems Network (DSN).

DSN/MRJE, also known as a Hasp workstation emulator, is a subsystem of the HP 1000 technical computer system, running under its RTE operating system. With this software, multiple HP 1000 users concurrently can submit batch jobs to and receive output from an IBM or plug-compatible system, according to a vendor spokesman.

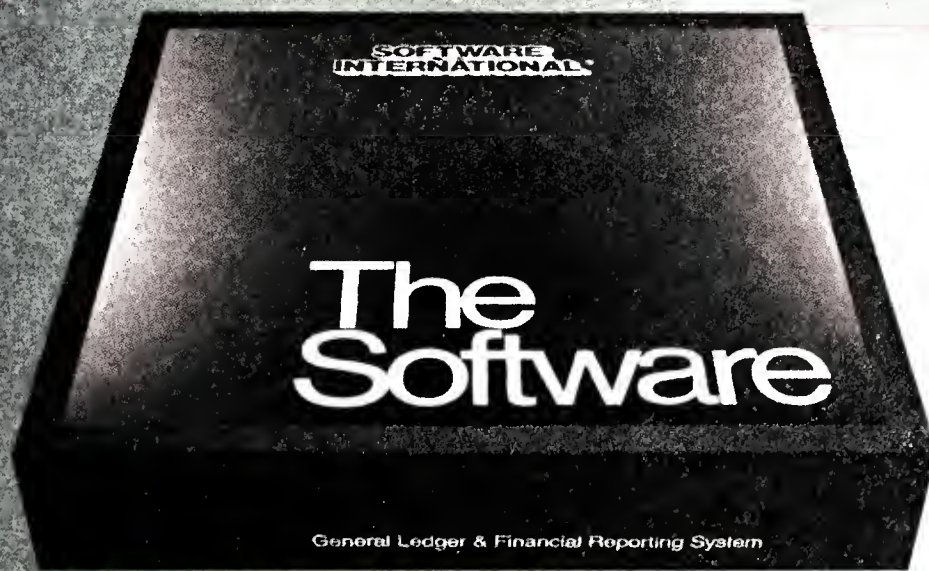
As many as seven input data streams, eight output data streams and one interactive console stream can be interleaved on the same communications line, the vendor said.

HP DSN/MRJE costs \$3,000 for the HP 1000 A600 computer, \$4,000 for the HP 1000 A700 or E and F series computers and \$6,000 for the HP 1000 A900 computer.

More information is available from HP, Inquiries Manager, at 1820 Embarcadero Road, Palo Alto, Calif. 94303.

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Firm Cuts Costs, Speeds Processing With In-House Financial System

(Continued from Page 41)

was gathered. That concerned the number of locations for which financial statements were to be produced, the number of payroll and accounts payable checks to be processed, the number of general ledger and general ledger journal ledgers to be processed, accounts payable vendors involved, the

number of accounts payable vouchers processed and the number of W-2 forms to be produced at year's end.

A second phase of the study involved an examination of both hardware and software. About 15 configurations were studied.

Montgomery looked for software that would meet needs without modification

and would offer room for expansion. "We had no in-house computer facilities, and we wanted to control our processing without creating a large processing shop," he explained.

He chose the full range of financial products from Software International Corp. (SI). They included general ledger and financial reporting, accounts payable, accounts receivable, payroll/personnel and fixed assets. "We recognized that having all the packages from the same vendor would help eliminate problems when we began to integrate the various packages," he noted.

PSI chose an IBM 4331 to implement their financial management operation. In early 1981, Montgomery and one in-house operator began integrating the general ledger system. The package was running by late spring, and two Canadian companies were installed on it that same year.

Flexibility Key

"After only one day of in-house training, we were able to set up the accounts and relationships that were required," he said. PSI then installed SI's Variable Report Writer (VRW). "When we used service bureaus, our financial reports weren't flexible enough to meet varying needs," Montgomery said. "Now we're able to utilize VRW to formulate and produce our reports in exactly the format we want."

He explained that PSI can produce budget profit and loss statements by profit center and show 13 periods of information. From this, the company can compare costs, percentages and totals for each period.

Payroll was a different problem. PSI's labor-intensive industry is characterized by turnover rates of several hundred percent, Montgomery said. "Not only do we have thousands of employees, but the labor of each employee must be tracked against the building the employee worked in. The problems are compounded when an employee works in 20 buildings during one pay period."

Montgomery tackled the payroll project by developing conversion programs that transferred the service bureau master files into the format utilized by the SI system so the transactions could be processed through its standard edits. PSI converted its first regional payroll, consisting of 3,000 checks per day, during the second quarter of 1982, he said.

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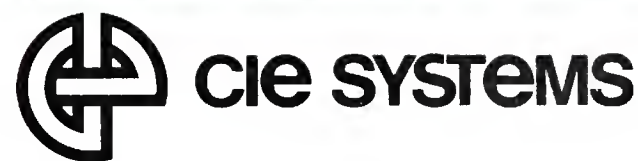
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For Prime 50 Series Users

Project Management System Out

ANN ARBOR, Mich. — T and B Computing, Inc. has announced a project management control system for the Prime Computer, Inc. 50 series of computers. The package is said to integrate project cost controls and scheduling with corporate financial control systems.

Called Intact 50, the package gives project and corporate managers the ability to

track all types of project information. Budgets, costs and variances can be tracked using a range of project attributes, a spokesman said. The modular system includes project accounting/cost evaluation (Pace), Track 50 scheduling, performance measurement report generator, general ledger with budget management, accounts payable/purchase order, ac-

counts receivable and payroll/personnel with labor distribution.

Pace is an automated system for tracking, analyzing and reporting project cost detail. More than 30 standard reports are available. Cost detail can be related to project schedule detail to fulfill Department of Education and Department of Defense 7000.1 and 7000.2 requirements.

Project scheduling is available through the Track 50 scheduling module, which contains systems for basic and advanced scheduling, resource leveling and network graphics. Track 50 can manage networks with up to 14,000 activities and it produces 22 standard reports.

Intact 50 can be used in a distributed processing mode on Prime systems, the spokesman said. The basic package costs \$40,000 from 1100 Eisenhower Place, Ann Arbor, Mich. 48104.

SCIENCE/SCOPE

A semiautomatic production line makes solar cells that are higher performing and much lower in cost than conventional cells. The facility at Spectrolab, a Hughes Aircraft Company subsidiary, creates highly uniform cells and increases productivity. It uses the latest techniques, including photolithographic masking for contact patterns, with subsequent contact plate-up. The first "mechanized" cells have been delivered to Hughes for the Intelsat VI communications satellites.

Printed circuit boards made of a new material may permit better direct soldering of large leadless ceramic chip-carriers. A Hughes study proposes using quartz-fabric-reinforced polyimide resin in place of glass-epoxy or glass-polyimide boards. The new material has nearly the same thermal expansion coefficient as ceramic chip carriers. When a leadless carrier is soldered directly to a quartz-fabric polyimide board, there are no shear stresses caused by heating or cooling. Such stresses often cause solder joints to fail on conventional reinforced printed circuit boards.

A new device "super cools" spaceborne infrared sensors to increase their sensitivity to thermal radiation. The Vuilleumier cycle cryogenic refrigerator is especially suited for use in space. The low internal forces required in this type of cooling cycle cause little wear on bearings and seals. The result is a long, maintenance-free operating life. Hughes engineers, under U.S. Air Force contract, expect to extend the operating life of the cooler beyond three years by 1985. Three space-qualified models have already been built, and over 60,000 hours of tests have been run on three engineering development models.

In the 80 seconds a cruise missile reaches a ship after breaking the horizon, an advanced radar system directs counterfire with extreme accuracy. The Hughes Mk-23 Target Acquisition System (TAS) combines with NATO's Seasparrow missile system to defend ships from sea-skimming and high-diving missiles that often escape conventional radar detection. TAS detects anything that flies above the water -- even a small cruise missile skimming the waves at the speed of sound -- because it filters out radar clutter caused by interference from the sea, land, weather, chaff, or electronic countermeasures. TAS will be carried by all U.S. Navy aircraft carriers and over 40 other high-value ships.

Hughes is seeking engineers to develop advanced systems and components for many different weather and communications satellites, plus the Galileo Jupiter Probe. Immediate openings exist in applications software development, data processing, digital subsystems test, microwave/RF circuit design, power supply design, digital communications, signal processing, spacecraft antenna design, system integration test and evaluation, and TELCO interconnection. Send your resume to Ray Bevacqua, Hughes Space & Communications Group, Dept. SE, Bldg. S/41, M.S. A300, P.O. Box 92919, Los Angeles, CA 90009. Equal opportunity employer.

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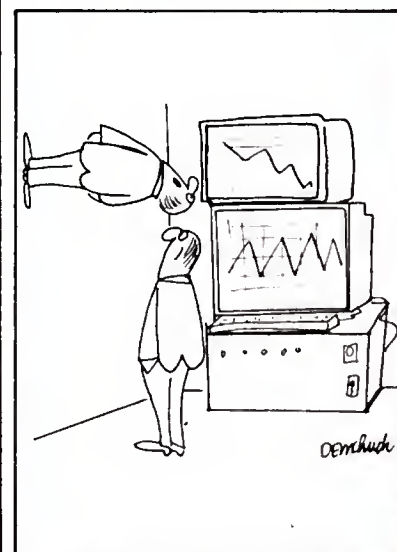
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'User-11' Out For Users Of DEC VAX

ESCONDIDO, Calif. — NCCS, Inc. has announced that its User-11 Data Management System is now available for the Digital Equipment Corp. VAX computer.

Previously aimed solely at DEC PDP-11 users, User-11V is said to be compatible with both RSTS/E and VMS. Data bases, dictionaries, menus and reports can be transferred and executed on either operating system without alterations, according to the vendor.

For the VAX 11/730, the software costs \$12,000; for the 11/750, the price is \$17,000; and for the 11/780, it costs \$22,000. Educational and volume discounts are available from the firm, which is located at 2235 Meyers Ave., Escondido, Calif. 92025.



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Tired of game playing at computer shows? **Sign up now for EMCE —**

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EMCE is for you!

The Executive Microcomputer Conference and Exposition (EMCE) is sponsored by the Conference Management Group of CW Communications/Inc., publishers of *Computerworld*, *InfoWorld*, *ISO WORLD*, and *PC World*. And it's designed especially for executives who are responsible for the selection

or use of micros in their organizations, executives who use micros as decision support tools, and business managers who employ (or want to employ) micros to manage their businesses.

EMCE gives you a complete conference program and exhibition:

- 48 conference sessions
- 3 days of exhibitions
- Hardware/Software selection
- Micros in smaller businesses
- Financial applications
- Special program of personalized instruction
- Future trends
- And much more!

COMPLETE, 3-DAY EXHIBITION

The latest equipment and services for micros will be displayed in a professional setting, that means you won't have to compete with kids playing games. It's designed for you to see, touch and learn what you need to know about micros. **Your conference registration includes complete, 3-day exposition attendance.** Or you can sign up for the exhibits only. If you register in advance, using the form in this ad, you get two bonuses:

1. **Early admission** — only conference registrants and advanced registrants will be admitted to the hall between 11 a.m. and NOON on Thursday and Friday.
2. **\$5.00 discount** on admission price at the door.

THE CONFERENCE PROGRAM

The Thursday and Friday conference program is divided into four major "tracks," but you are not required to sign up for a particular group of sessions. You may select the sessions you need from any of the 48 sessions available and create a conference program designed to suit your unique

I. For Executives in large corporations who are involved in using micros in distributed data processing or as standalone executive workstations, the EMCE conference program includes:

- *Keynote: Increasing Corporate Productivity via the Personal Computer* — (Thurs.)
- *The Executive/Professional Workstation* — (Thurs.)
- *DDP with Microcomputers* — (Thurs.)
- *The Information Resource Center* — (Friday)
- *The Role of Apple and IBM in Corporate Computing* — (Friday)
- *New Issues of Confidentiality and Security in Organizational Information Processing* — (Friday)
- *Personal Computer Acquisition, and Implementation Strategies* — (Friday)
- *Compatible Systems and Software for the IBM PC* — (Friday)

II. For Executives who are concerned with the selection and use of microcomputers **primarily in smaller businesses**, the EMCE conference highlights:

- *Keynote: The Personal Computer: The Mouse that Roared!* — (Thurs.)
- *How to Buy a Personal Computer* — (Thurs.)
- *Spread Sheet/Financial Applications* — (Thurs.)
- *New and Future Trends in Personal Computing* — (Thurs.)
- *Word Processing Packages for Personal Computers* — (Friday)
- *DBMS on Personal Computers* — (Friday)
- *A Look at Integrated Software Packages* — (Friday)
- *Panel: Executive Personal Computer Success* — (Friday)

III. For Executives who wish to keep up with changing microcomputer technologies in **mass storage, business graphics, operating systems** and more, the EMCE conference highlights:

- *Keynote: The Future of Personal Computer Software for Business* — (Thurs.)
- *What's New in Peripherals* — (Thurs.)
- *Developments in Personal Computer Business Graphics* — (Thurs.)
- *Mass Storage Capabilities* — (Thurs.)
- *Information Utilities* — (Thurs.)
- *Popular Programming Languages* — (Thurs.)
- *Operating System Selection: 8 to 16 Bit* — (Thurs.)
- *Developments in Networking* — (Friday)

IV. For Entrepreneurs, Dealers, Distributors and Systems Houses, we'll offer sales and venture capital strategies you won't want to miss. Session highlights include:

- *Keynote: Retail Opportunities in the Personal Computer Marketplace* — (Thurs.)
- *Software Packaging and Distribution* — (Thurs.)
- *Raising Venture Capital for Software and R&D* — (Thurs.)
- *Legal Issues for the Retail Distributor* — (Thurs.)
- *Market Update: Competition from Japan* — (Friday)
- *Successful Training Strategies for Vendors and End Users* — (Friday)
- *Delivering Good Maintenance, Service & Support* — (Friday)
- *Selling the Corporate Account: Problems & Pitfalls* — (Friday)

SPECIAL PROGRAM FOR EDUCATORS

For Educators and Administrators, EMCE will hold a special seminar on Saturday, June 25th entitled **Microcomputers in Education** which includes the following sessions designed to suit the unique needs of education:

- *Keynote: Computer Assisted Instruction in Education*
- *Computer Funding and Acquisition*
- *Logo: An Educational Language*
- *Teacher Training*
- *Administrative Applications for Educational Institutions*
- *Educational Computing at Home*

EMCETM Executive Microcomputer Conference & Exposition

EMCE — Sheraton Centre, New York City
June 23-25, 1983

Register for EMCE now! The Sheraton Centre in New York City is the place; June 23-25, 1983 are the dates. Exposition hours: 11-7, Thursday and Friday; 10-6, Saturday. For more information on the conference and exposition, dial 1-800-225-4698 (In Massachusetts, 617-879-0700) and ask for Louise Myerow.

FREE SATURDAY FEATURE SESSIONS FOR ALL ATTENDEES

FREE Special Feature Sessions for exhibit and conference attendees will be held Saturday, June 25 from 9:00-1:00 p.m. The sessions will focus on professional applications for micros and starting your own home based business or office, and will also discuss the personal computers impact on family life, kids and recreation.

SPECIAL HANDS-ON WORKSHOP

In addition to the main conference program, EMCE will offer a two-day **Executive Microcomputer Workshop** for those professionals who wish to get hands-on experience with an Apple or IBM Personal Computer. The workshop will focus on four specific applications: spreadsheet analysis using VISICALC, data base management using dBase II, graphics and communications. An in-class network will be set-up to demonstrate the communications capabilities of personal computers. The two-day seminar will run concurrently with the EMCE Conference Program and will include admission to the exhibits and special feature sessions on Saturday, June 25. The **Executive Microcomputer Workshop** will be sponsored by the Personal Computer Learning Center of New York City and will be held at the Center, located at 1120 Avenue of the Americas, on Thursday and Friday June 23 & 24. Enrollment is limited, so please register early with your choice of hands-on using either an Apple or an IBM PC.

CONFERENCE REGISTRATION

Includes Complete Exhibit Admission with 11:00 a.m. early admission privilege

- ☐ Full Two-Day Conference Registration \$295
- ☐ One-Day Conference Registration \$195
- ☐ Thursday only ☐ Friday only ☐
- ☐ Executive Microcomputer Workshop \$595
- ☐ Thursday and Friday
- Choose one: Apple ☐ IBM PC ☐
- ☐ Micros in Education \$ 95
- Saturday, June 25

Conference Registrants Only May Register by Phone: Call 800-225-4698, In Mass. call collect 617-879-0700 and ask for Louise Myerow.

REGISTRATIONS CANCELLED later than June 15 are subject to a \$50.00 service charge. Registration may be transferred at no charge.

- ☐ Yes! Register me for EMCE (fill out attached conference form)
- ☐ Yes! Register me for EMCE Exhibit Only (fill out attached exhibit form)
- ☐ Send Information Only!

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Box 880, Framingham, MA 01701.

EXHIBIT ONLY REGISTRATION

SAVE \$5 by Registering in Advance and Get Early Admission.

(Only advance registrants will be allowed into show between 11:00 a.m. and NOON on Thursday and Friday)

- ☐ Advance Pre-Paid 3 day exhibit registration \$20 (\$25 at door)
- ☐ Advance Pre-Paid 1 day exhibit registration \$10 (\$15 at door)
- ☐ Thursday
- ☐ Friday
- ☐ Saturday

3-Day Exhibit Registration Includes Special Feature Sessions on Saturday, June 25 from 9:00 a.m. to 1:00 p.m.

YOU MUST ENCLOSE YOUR CHECK OR CHARGE INFORMATION. WE CANNOT BILL YOU OR TAKE YOUR EXHIBIT REGISTRATION OVER THE PHONE. EXHIBIT REGISTRATION IS NON-REFUNDABLE.

Wang VS Users Get Nine Programming Aids

HIALEAH, Fla. — Business Computer Solutions, Inc. has released nine Wang Laboratories, Inc. VS-compatible programming aids and utilities.

The Automated Letter Processing System (Alps) is said to integrate VS data processing and word processing to produce customized letters.

Pro/sys is a security and encryption system that combines both the security function and the program function of the VS system.

Renumbering Control File allows a user to open a space in an existing Wang control file and insert a new field without having to delete and reenter following fields.

Cntrlgen generates a control file based on an existing file definition

without calculating field sizes.

Dellines deletes a line or a range of lines, while Insblank inserts lines on Wang's Ezprint report definition.

Lookfil searches a volume for up to 12 entries of a given file name and

can return the location of that file.

Modout allows the user to modify or erase Wang editor comments from previously locked-in positions after program modification. Printsl generates a printed report of all Wang se-

lects in all programs within a library.

Alps and Pro/sys are priced at \$1,500 each. The remaining packages are available for a combined price of \$1,500 from Suite 106, 1840 W. 49th St., Hialeah, Fla. 33012.

Management Tool Out for HP 3000 Users

PHILADELPHIA — AGS Management Systems, Inc. has announced PAC I, an automated project management package for the Hewlett-Packard Co. HP 3000 under the MPE IV operating system and for Digital Equipment Corp. PDP-11 and VAX-11 computers.

The interactive system performs critical path analysis, resource plan-

ning, cost analysis and projections and progress monitoring for an unlimited number of projects, the company claimed. End users can be trained on the system within a day.

Possible applications include product development and engineering, capital projects, research and development, new product introduction, maintenance scheduling and

construction, the company said.

The PAC I system comes with an interactive report writer, a printer graphics network logic program and one day of on-site training for \$20,000 from AGS at 320 Walnut St., Philadelphia, Pa. 19106.

Net Accesses Financial Info

NEW YORK — Monchik-Weber Corp. has announced real-time financial application data base services via its Info Network System.

Subscribers reportedly can receive and display current prices for all the financial instruments supported by the network.

The Info Network System is supported by 26 different exchange and quotation sources, including those covering exchanges in New York, Chicago, Philadelphia, San Francisco and other U.S. financial centers.

The network is available via Monchik-Weber's direct-access terminal system, on a dial-up basis or through such networks as Tymnet, Inc.'s Tymnet.

Prices range from \$700/mo to \$2,500/mo, depending on services selected, a spokesman said from 11 Broadway, New York, N.Y. 10004.

DNA's HRMS Now Available On T/S Basis

CHICAGO — Distributive Network of America (DNA) has made SMS Management Systems' human resources management system (HRMS) available to DNA time-sharing customers.

HRMS is an on-line, real-time personnel system designed and written on the Sperry Corp. 1100 series mainframe computer. Access is available through Uninet.

HRMS is said to maintain data for basic personnel information, education and training and employment history with options for skills inventory, succession planning, flexible benefits, equal employment opportunity reporting, applicant log, seniority roster, safety/accident reporting and medical history. The system reportedly produces more than 25 standard reports and utilizes Sperry's Mapper software for ad hoc reporting.

Prices vary based on connect time, computer usage, options selected and number of employees. DNA has data centers in Dallas, Chicago and Washington, D.C.

Additional information on the system is available from the firm headquartered at 10 W. 31st St., Chicago, Ill. 60616.

VM Information Center Developmental Center

VM Software Shopping Center? [Great Idea!]

If you've considered implementing an Information Center or Development Center under VM, you've discovered two things:

- 1 VM can't be matched, for fast interactive response time, flexibility and user friendliness. It's a *great* product from IBM!
- 2 System software products to help you manage your VM Center just aren't available from your traditional DOS/MVS software vendors, nor from IBM.

Welcome To The VM Shopping Center

VM Software, Inc. has exactly the software products you need, to be effective with VM from the start... As much or as little as you need. From the undisputed leader in VM products.

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- Saves up to 90% of time by dumping only changed data
- Dumps all data—both CMS and non CMS
- Protects tapes and saves space with multivolume SL tape support
- Supports disk compaction and device migration
- Provides security with optional data encryption

VMARCHIVE

- Provides space management tool to end users
- Saves space by using high compression format
- Complete audit trail of activity
- Archived data may be kept on disk or tape
- Comments, version tracking, and more

VMTAPE

- Provides accountability and security for VM tape volumes
- Provides flexible control by managing any number of tape volume series and tape drives
- Supports SL tape usage
- Eliminates operator tasks other than the physical volume mount
- Optional interface to OS/VS systems

VMLIB

- VM Library Control System allowing users to share source code without duplication
- Allows synchronization of source and object code
- Interface to DOS and OS systems
- Provides control and security by user, by program, and by function

VMSECURE

- Comprehensive security for the VM environment
- Permits encryption of data with no source code changes
- Simple end user command language
- Allows user to administer security

VMDEFER

- Permits users to schedule any event (e.g. payroll, and EXEC) on any basis
- Allows load balancing of CPU by permitting events to be run in off prime
- Serves as substitute for CMS BATCH with limitations on CPU and I/O resources but no control cards
- English language commands allow easy usage and include special range features such as holidays

If your needs change later, or if you don't like the way we implement something (it happens), turn in one product for a different one at no extra charge. (Even one of the new ones we're planning). Now, what could be fairer than that? We're good, we know we're good, so we take a little risk.

More than 200 of the largest companies in the world are already using our VM products including 35 of the Fortune 50. (We won't tell whether number 38 is on the list). That's because we offer the best VM products available—anywhere. Call us, write us, but if you're looking at VM, you can't afford to ignore us.

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One simple RPG II conversion to Wang can turn a system you've outgrown into a system you can't outgrow.

If you're currently considering a conversion from an IBM System 34 or similar environment, Wang has a better way to go. And a better way to grow.

The Wang RPG II Conversion Aid Package and the Wang VS family of 16- and 32-bit computers.

This package offers a fast, easy approach to system conversion. It's end-user oriented, menu-driven, and requires so little time and trouble, it's easily cost-justified.

But best of all, the RPG II package opens up an almost limitless growth path into the Wang VS line — a line that's expandable, upgradeable and integrated from low to high end. And because all VS computers run on compatible operating systems and support the same applications software, the hassle of computer conversions is a thing of the past.

If you're facing a computer conversion because you've outgrown your present

computer system, take the growth path with the future built in. The Wang RPG II Conversion Aid Package and the Wang VS line of computers.

For more information about the Wang RPG II Conversion Aid Package, call

1-800-225-9264

or send this coupon to:
Wang Laboratories, Inc.
Business Executive Center
One Industrial Avenue
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A831

WANG

The Office Automation Computer Company

'Data Storage/Retrieval' Out For Users of Point 4's Iris

LOVELAND, Colo. — Computer Technology Systems has introduced a data base management system for users of the Point 4 Data Corp. Iris operating system with 64K-bytes or more of memory.

Called Data Storage/Retrieval (DS/R), the package is an integrated data base retrieval, reporting and management system that is oriented toward the end user, a spokesman said. A sort rou-

tine is included giving sort capabilities to each field in a file, according to a vendor spokesman.

The user can specify up to five fields for a multikey, multilevel sort. The data base file and record can be lengthened, shortened or modified with all file rebuilding handled by the DS/R system.

The package costs \$500 from 1531 N. Lincoln Ave., Loveland, Colo. 80537.

Finance Tool Fits System/23

CHARLOTTE, N.C. — Charlotte Management Software Corp. has announced an accounts receivable package for the IBM System/23 Datamaster.

The package reportedly allows for multiple company support, open item or balance forward by customer, on-line inquiry for current transactions and credit limit checking during invoice entry.

Reports that are available include customer master listings, delinquency reports, aged trial balance, invoice register, cash receipts and adjustment register and statements and history reporting, the vendor said.

Accounts Receivable is available for a one-time license fee of \$950. Additional information is available from the vendor through Box 18646, Charlotte, N.C. 28218.

'Speed' Enhanced for MV, Eclipse

WALTHAM, Mass. — Horizon Software, Inc. (HSI) has announced the conversion of its Speed manufacturing simulation package to run on the Data General Corp.'s MV series of 32-bit

minicomputers and 16-bit Eclipse line.

Speed was designed to aid manufacturing managers in production system-related decision making. It offers nonexperienced users the

ability to simulate the actual operation of their systems, with output reports indicating bottlenecks, machine utilizations and work-in-process inventory.

Speed currently runs on IBM, Control Data Corp., Hewlett-Packard Co., Prime Computer, Inc. and DG equipment, requiring only a Fortran compiler. The basic package is available for \$18,000, including installation and training, from HSI, 460 Totten Pond Road, Waltham, Mass. 02154.

On-Line Data Base Link Out For Users of System/34, 38

BURR RIDGE, Ill. — A utility program that links IBM System/34 and System/38 workstations to on-line data bases has been announced by Access Telecommunications.

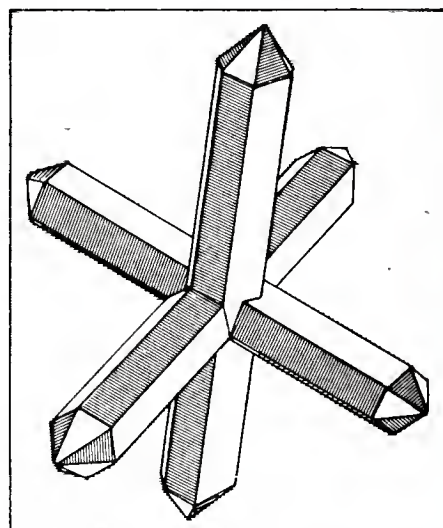
Called On-data, the product runs with Access Telecommunications' Access/34 or Access/38 systems for connection to various information services. On-data is initiated at a workstation to establish the data base connection through the autodial feature of a modem and Access/34 or Access/38. The user can review data, send data to a system printer or archive the data. The only requirement of the data base is that the user provide the sign-on format specified by the service.

The On-data utility program sells for \$750 from Access Telecom at 60 Shore Drive, Burr Ridge, Ill. 60521.

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Fortran Users Gain Access To Isam Files

WYOMISSING, Pa. — A file-handling system said to provide index sequential file access directly from Fortran application programs is available from Computer Tamers, Inc.

Fortran Index Sequential Access Method (Fisam) reportedly can be used on most computers that support Fortran 77, including IBM mainframes, Hewlett-Packard Co. HP 3000 and Prime Computer, Inc. machines and IBM Personal Computers.

Ansi-standard Fortran 77 subroutines are used to create and delete data files, keys and passwords and to add, access and delete data records. Fisam subroutines require less than 24K bytes of memory.

The software costs \$12,000 for mainframes, \$2,000 for minicomputers and \$400 for microcomputers. The vendor is located at 1222 Dauphin Ave., Wyomissing, Pa. 19610.

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first word processing program that actually teaches you how to use it; and Microsoft BASIC to help you write your own programs.

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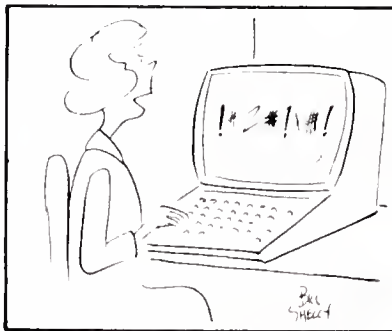
Otherwise, you'd think it was just too good to be true.

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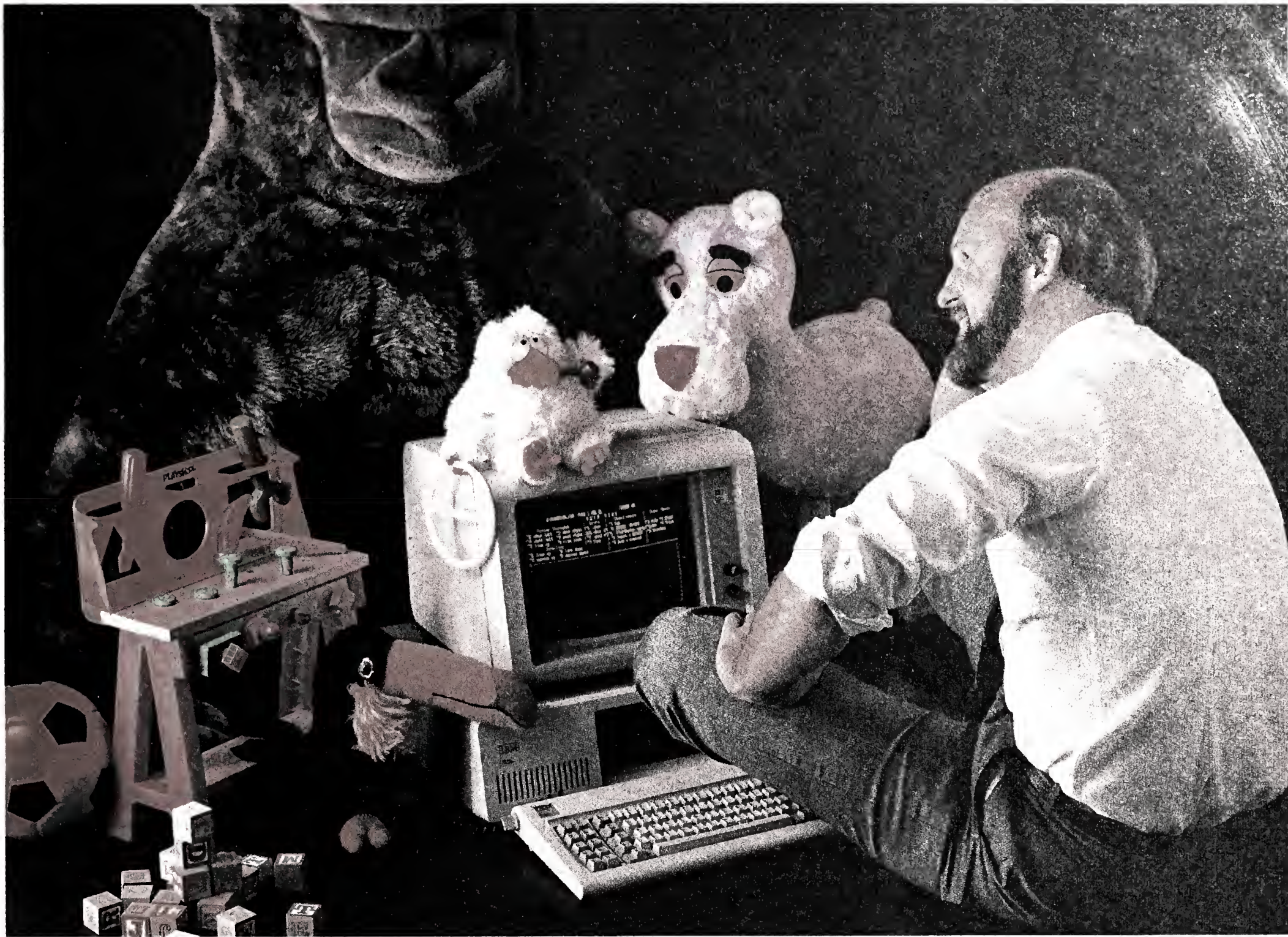
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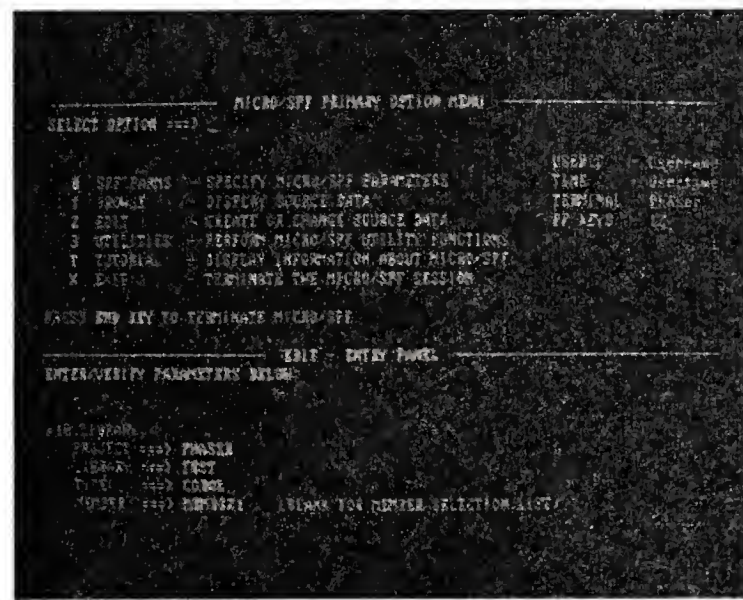
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family. And precisely because it is a family, new functions can be added on to your current Dimension System as they're developed, without replacing a lot of equipment or retraining personnel. Think how much smoother your business will run with a system you can control and maintain yourself.

The Dimension family's new System 85. It's the family that will be around for generations to come.

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Execucom Systems Corp. has introduced the **Interactive Financial Planning System (IFPS)/Personal**, a distributed decision support (DSS) software package for the IBM Personal Computer. The software is designed to complement the firm's IFPS DSS for larger systems, enabling files to be downloaded from mainframe data bases to IBM Personal Computers and uploaded from personal computers to mainframes.

The nonprocedural modeling language, commands and routines for IFPS/Personal are said to be identical with those of the mainframe-level IFPS, the vendor noted, adding that the models created with IFPS/Personal can run on the mainframe-level IFPS system.

Users of IFPS/Personal will receive a six-part support program that includes optional, one-day, on-site training; advanced training for system coordinators who will provide additional assistance for individual users; Execucom "hot-line" assistance for system coordinators; a user reference manual; a pocket-sized reference card; and a tutorial on model building and problem solving, available

on-line or in hard copy, a vendor spokesman said.

IFPS/Personal is priced at \$20,000 for a minimum order of 10 copies. It will be available during the second quarter of 1983 to existing IFPS sites, the vendor said from 3410 Far West Blvd., Austin, Texas 78734.

Pyramid Data Ltd., has announced **Number Cruncher**, a financial modeling package for the IBM Personal Computer and the Digital Equipment Corp. Decimate microcomputer.

The product offers flexible formatting, text editing and calculating facilities and lets the user assign word names rather than code names to variables. Numbers to be used in calculations can be placed anywhere in the text, a vendor spokesman said.

Number Cruncher costs \$395 through P.O. Box 10116, Santa Ana, Calif. 92711.

Micro Notes

Informatics General Corp. has announced **Terminal Application Processing System (Taps)/PC Connection**, a word processing/office automation product said to allow communications between up to 128 IBM Personal Computers. The system includes hardware and software.

Its functions include electronic mail, document filing, automatic calendar, message recording and forwarding, directory maintenance and name and address files.

The package costs \$500 to \$800 per computer from 401 Park Ave. S., New York, N.Y. 10016.

Able Associates has released an educational software system designed for training new users in techniques of manufacturing resource planning (MRP). **Training and Education Aid for Manufacturing (Team)** is a closed-loop MRP II

system that allows users to practice MRP II on an Apple Computer, Inc. Apple II+ or Apple IIe microcomputer without affecting the company's manufacturing data base.

An 80-col. printer is recommended to use the package effectively, a spokesman said. It costs \$1,500 from 516 Old Dodgingtown Road, Bethel, Conn. 06801.

The Adalcar Group Ltd. has released a computerized **job interview package** that can be adapted to a variety of microcomputer systems. The job interview system allows users to format questions for screening applicants prior to a personal interview. The system points out contradictions, ambiguities and areas warranting further examination in applicant responses, a spokesman said.

Initial prices include \$750/day consultation and installation with a \$450/mo minimum thereafter. Prices are \$10 per interview for the first 10 interviews, reduced to \$1 per interview for 21 or more. Adalcar is at 561 Union Ave., Buckminster Place Extension, Framingham, Mass. 01701.

RR Software has announced a new version of the **Janus/Ada compiler** for Intel Corp. 8086/8088-based systems. Version 1.4.6 includes integral 8087 floating point support, which eliminates the overhead of subprogram calls for floating point operation, delivering better microprocessor numeric support, a spokesman said.

The compiler costs \$400 for 8086/8088-based microcomputers with 128K bytes of memory, two disk drives and Microsoft, Inc. MS-DOS, PC-DOS or Digital Research, Inc. CP/M-86. For 8080/Zilog, Inc. Z80 microprocessors with 56K bytes of memory, two disk drives and CP/M-80 1.4 or newer, prices start at \$300 through P.O. Box 1512, Madison, Wis. 53701.

Version 3.3 of **Power** for microcomputers using Digital Research, Inc.'s CP/M operating system has been introduced by Computing!, Inc. The package allows the user to sort disk directories and perform other housekeeping utilities. The new version offers password protection. It is available for \$149 from the vendor at 2519 Greenwich, San Francisco, Calif. 94123.

Micro Architect, Inc. has introduced eight packages to run under Digital Research, Inc.'s CP/M. They include **Interactive Data Manager (IDM-X)**, a data base manager; **Mail-X**, a mailing list program; and **INV-X**, an inventory control program. Prices range from \$55 to \$295 from the vendor at 96 Dothan St., Arlington, Mass. 02174.

Eagle Software Publishing, Inc. will make its **Money Decisions** software available on the Olivetti Corp. M-20 personal computer. Also available for a variety of micros, including equipment from Apple Computer, Inc. and IBM, the software comprises two volumes for financial decision making, a vendor spokesman said.

Volume I costs \$199; Volume II costs \$229; and Volumes I and II cost \$399 from 993 Old Eagle School Road, Wayne, Pa. 19087.

Abacus Data, Inc. has enhanced its **Informa X** information management system with a Pascal version featuring cross-file data sharing, multiple file reporting, multiple screens per record and increased data file capacity, a spokesman for the vendor said.

The system reportedly runs on a variety of 8-bit or 16-bit systems. It costs \$795 for a single-user version and \$995 for a multiuser version from 1920 San Marco Blvd., Jacksonville, Fla. 32207.

A \$50 runtime version of Softech Microsystems, Inc.'s **P-System operating system** is available from IBM for the IBM Personal Computer through IBM's Product Centers and retail outlets. More information is available from Softech Microsystems, which is located at 16885 W. Bernardo Drive, San Diego, Calif. 92127.

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TI Offers Terminal, Interface Pair, 300 Series Update

By Susan Blakeney
CW Staff

NEW ORLEANS — In conjunction with its national users group meeting held here recently, Texas Instruments, Inc. unveiled its first fiber-optic transmission terminal, the Opti 900 Model 931, and two additional interfaces for its Business System 600 and 800 series. At the same time, the company announced the expansion of its Business Systems 300 series multiuser system to accommodate seven terminals.

The Opti 900 Model 931 terminal is said to communicate at speeds up to 19.2K bit/sec, and comes in both an RS-232C standard interface version and a fiber-optic version. Both can utilize an RS-232C port for short distance local connections and remote connections via modem. The fiber-optic version for local connections up to 3,000 feet reportedly provides immunity to electrical noise, less radiation and better speed for building-to-building connections, a TI spokesman said.

The terminal also provides an auxiliary printer port, which drives a printer directly from the terminal. Special print buffers (Continued on Page 58)

Teletype Adds Windowing To Programmers' Arsenal

SKOKIE, Ill. — Teletype Corp. will introduce four terminals — one of which is said to bring the windowing capability of office workstations to the programmer level.

The four communicating terminals will be exhibited for the first time at the 1983 National Computer Conference, a company spokesman said.

The high-end Teletype 5620 terminal allows programmers to access multiple windows of varying length and width, said to permit development of different portions of a single program or multiple programs in each work space. Each window on the screen looks like a separate physical terminal to the host, a vendor spokesman said.

The asynchronous 5620 can operate in either switched or point-to-point private line environments and uses Bell Laboratories' Unix operating system. The 15-in. diagonal display contains 100 dot/in. and permits the use of graphics and line drawing.

The terminal also features high-resolution, dot-matrix characters and a detached keyboard. It provides 256K bytes of ran-



Teletype's 5620 Terminal

dom-access memory and 48K bytes of read-only memory and offers selectable keyboard settings of 300, 1,200, 9,600 and 19.2K bit/sec.

The 5620 will sell for \$6,115, with ship- (Continued on Page 60)

DCA Unveils Net Processor, Terminal Interface Processor

NORCROSS, Ga. — Digital Communications Associates, Inc. (DCA) has announced a network processor and a terminal interface processor (TIP).

The System 335 network processor, based on DCA's Integrated Network Architecture (INA), is said to function with one to four trunks in several combinations.

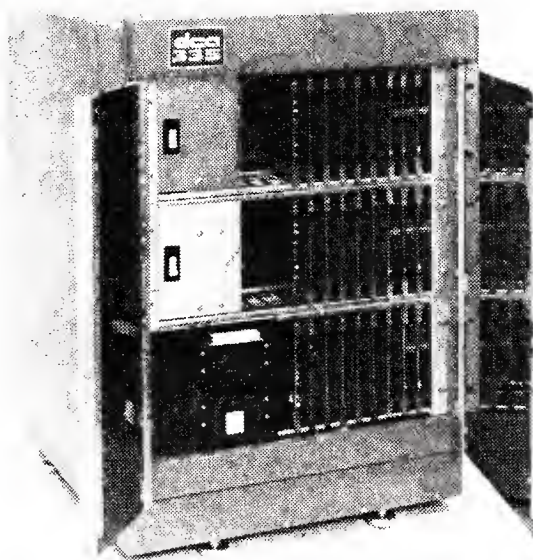
The System 335 reportedly will drive DCA Series 100 or 200 statistical multiplexers, as well as the System 325 Net-switch; it will connect to another System 335 or to a larger System 355; or it will drive an X.25 gateway interface into a packet mode host or a public data network.

Prices for the System 335 start at \$6,795, according to the vendor.

INA/TIP is said to interconnect asynchronous Ascii terminals with an X.25 communications link and reportedly operates in accordance with all current standards of the X.25 family.

The product uses the X.25 protocol to interface to a host computer or interface an INA/TIP to an X.25 packet-switched network. INA/TIP is said to feature a full-duplex data link running at up to 19.2K bit/sec.

Supporting up to 32 asynchronous devices, the INA/TIP starts at \$3,095 from



DCA's System 335 Net Processor

Digital Communications Associates, located at 303 Technology Park, Norcross, Ga. 30092.

Teleray Out With Dual-Mode Terminal

MINNEAPOLIS — The Teleray Division of Research, Inc. has introduced the Model 16/7801, said to combine Ansi X3.64 and Honeywell, Inc. 7801 software compatibility in a keyboard-selectable, dual-mode terminal.

In Ansi mode, the terminal reportedly is a user-definable, eight-page editor. Operating in 7801 mode, it contains all the characteristics of the 7801, including the 72-line scrolling option and selectable character, text and form modes.

Features include expanded sets of 64 line drawings, 64 mosaic graphics and sci-

entific notation characters; a buffered, bi-directional RS-232 peripheral port; 12 pre-programmed function keys; a 512-char., nonvolatile function memory; five hidden display attributes; and nine field qualifiers usable in every character position.

Available in three different enclosure styles and three CRT phosphors — white, green and amber, the Model 16/7801 is priced at \$1,795 for the 12-in. version and at \$1,995 for both the 9- and 15-in. versions. More information is available from Teleray through P.O. Box 24064, Minneapolis, Minn. 55424.

Fiber-Optic Link Out for Nonstop II

CUPERTINO, Calif. — Tandem Computers, Inc. has introduced a system-to-system fiber-optic link said to allow the connection of up to 14 close-proximity Tandem Nonstop II systems into a high-speed network.

The Fiber Optic Extension (FOX) provides a means for high-speed communication among up to 14 systems at a site. Two pairs of transmit/receive fibers are used to achieve full-duplex capability and fault tolerance — making four fibers in all between every two systems on the link, a vendor spokesman said.

Each fiber-optic strand is said to transmit data at 1M byte/sec. The price for a FOX system, including controllers, backplane, interprocessor bus cables and five fiber-optic strands of 100 meters each is \$38,750. More information is available from Tandem, 19333 Vallco Pkwy., Cupertino, Calif. 95014.

Modems, Muxes Unwrapped

HUNTSVILLE, Ala. — Universal Data Systems, a division of Motorola, Inc. has announced models of limited distance modems and statistical time-division multi-

plexers.

The limited distance modems reportedly reach speeds and distances up to 23 miles at 19.2K bit/sec. For shorter distances, two models of line drivers are available with data rates up to 100K bit/sec and distances from a few thousand feet to 1.5 miles.

The four models of statistical time-division multiplexers are available in configurations ranging from two to eight channels, offering speeds from 2,400 bit/sec to 19.2K bit/sec, a spokesman said.

Prices for the seven models of limited-distance modems and line drivers range from \$197 to \$750; the range for the statistical time-division multiplexers is from \$675 to \$4,800.

Additional information is available from the vendor at 5000 Bradford Drive, Huntsville, Ala. 35805.

COMMUNICATIONS

Ansi-, IBM-Compatible Extended Desk Set Announced

MERRIMACK, N.H. — Datavox Communications Corp. has unveiled an extended desk set compatible with Ansi 3.64 and IBM 3270 protocols.

The desk set is also said to provide single-button access to most computer systems and an integrated intelligent telephone, the vendor spokesman said.

The Datavox Extended Multifunction Deskset reportedly offers both IBM Binary Synchronous Communications and Systems Network Architecture/Synchronous Data Link Control compatibility for use with IBM and compatible main-

frame computers. The device also reportedly operates as an Ansi 3.64 terminal for use with a variety of minis.

In addition, the desk set is said to function as a dial-up Ascii/teletypewriter terminal for access to outside time-sharing, electronic mail and assorted information services.

Features of the desk set include a personal phone directory with up to 85 entries possible, automatic dialing from a host computer data base and 16 user-programmable keys that are designed to perform complex logons, a vendor spokesman said.

Options include multi-

page scrolling and printer support as well as emulation of protocols.

The desk set is priced at \$2,180 from Datavox, 6 Continental Blvd., P.O. Box 328, Merrimack, N.H. 03054.

TI Unveils Terminal, Interface Pair

(Continued from Page 57) reportedly give the operator full use of the terminal while a print operation executes transparently.

The 24-line by 80-char. phosphor screen is said to display text in a variety of formats. The product, slated for delivery beginning in September, will be available in the following configurations:

- RS-232C mode with interface cable to TI Business System 600 series or 800 series (\$1,295).

- Fiber-optic with interface cable to TI S600 or S800 (\$1,450).

- Multimode RS-232C/fiber-optic without cable (\$1,350).

- RS-232C with modem interface cable (\$1,295).

The two additional interfaces that were announced for use with TI's Business System 600 and 800 series are the Communications Interface C1404 and C1403.

The former reportedly provides four fiber-optic channels that allow connection of four Model 931 fiber-optic terminals. The C1403 provides four buffered asynchronous channels to support four Model 931 RS-232C terminals. These interfaces are priced at \$1,500 and \$1,100, respectively.

Finally, the multiuser capacity of the Business System 300 series has been boosted from three to seven users with the addition of a four-channel communications board, installed in conjunction with the add-on, two-channel board.

Each terminal used in the system network reportedly has its own printer port, so print capacity also expands to seven printers, TI said.

Four systems in the Business System 300 series allow for a variety of applications and storage capacities, the vendor said. Prices range from \$12,495 to \$21,800. Adding the multiuser options, which will be available in July, costs \$850.

Further details on these products can be obtained from Texas Instruments' Data Systems Group, through P.O. Box 402430, H-650, Dallas, Texas 75240.

Raytheon Announces Cuts For PTS-2000 Terminals

NORWOOD, Mass. — Raytheon Data Systems Co. has announced price reductions for volume lease and purchase of its PTS-2000 product line of data processing terminals. The reductions apply to one-year commitments in excess of \$75,000 for either purchased or leased equipment, when using new three- to five-year lease options.

Items reduced include large and small cluster controllers, monochrome and color displays, 150 char./sec printers and all keyboards.

The tilt and swivel base has been made a no-cost option.

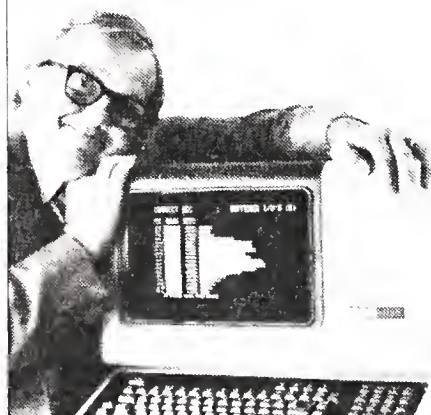
Purchase price reductions for the PTS-2000 Model 2078-2 terminal with keyboard average 27%. Other items have been reduced approximately 10%. A typical small cluster configuration — with three displays and keyboards and one printer — is now priced at \$11,785.

More information is available from Raytheon Data Systems' Marketing Communications Department, 1415 Boston-Providence Tnpk., Norwood, Mass. 02062.


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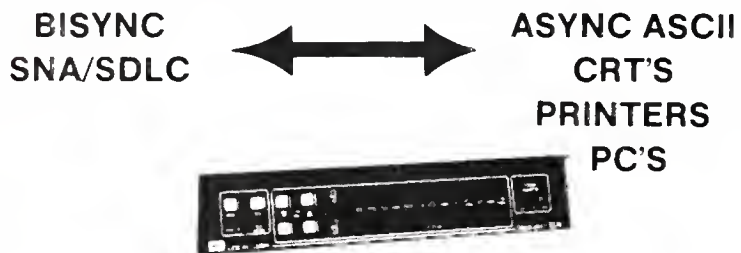
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LA100 Letter Printer RO	1,995	190	106	72
LA120 DECwriter III KSR	2,295	220	122	83
LA120 DECwriter III RD	2,095	200	112	75
LA12A Portable DECwriter	2,950	280	155	106
VT100 CRT DECscope	1,695	162	90	61
VT101 CRT DECscope	1,195	115	67	43
VT125 CRT Graphics	3,295	315	185	119
VT131 CRT DECscope	1,745	167	93	63
VT132 CRT DECscope	1,995	190	106	72
VT18XAC Personal Computer Option	2,395	230	128	86
TEXAS INSTRUMENTS				
TI745 Portable Terminal	1,595	153	85	58
TI765 Bubble Memory Terminal	2,595	249	138	93
TI940 CRT	1,795	173	96	65
TI785 Portable KSR, 120 CPS	1,795	173	96	65
TI787 Portable KSR, 120 CPS	2,195	211	117	80
TI810 RD Printer	1,695	162	90	61
TI820 KSR Printer	2,195	211	117	80
LEAR SIEGLER				
ADM3A CRT Terminal	595	57	34	22
ADM5 CRT Terminal	645	62	36	24
ADM32 CRT Terminal	1,165	112	65	42
C-ITOH				
CIT-101 CRT	1,525	147	82	55
CIT-161 Color CRT	2,675	257	143	97
CIT-427 Color Graphic CRT	3,095	297	165	112
TELEVIDEO				
910 CRT Terminal	650	62	36	24
925 CRT Terminal	850	82	46	31
950 CRT Terminal	1,075	103	57	39
NEC SPINWRITER				
Letter Quality, 7715 RD	2,695	259	144	98
Letter Quality, 7725 KSR	3,195	307	171	115
GENERAL ELECTRIC				
2030 KSR Printer 30 CPS	1,195	115	67	43
2120 KSR Printer 120 CPS	2,195	211	117	80
EPSON				
MX-80 F.T. Printer	745	71	42	27
MX-100 Printer	895	86	48	32
TIMEPLEX				
EQ400 4 Channel Stat Mux	1,525	147	82	55
EQ800 8 Channel Stat Mux	2,050	197	110	74

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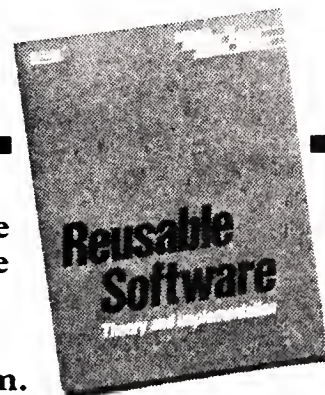
Only the new, application-specific code written for each program has to be tested at development time. And that code, and that code only, has to be tested during maintenance procedures.

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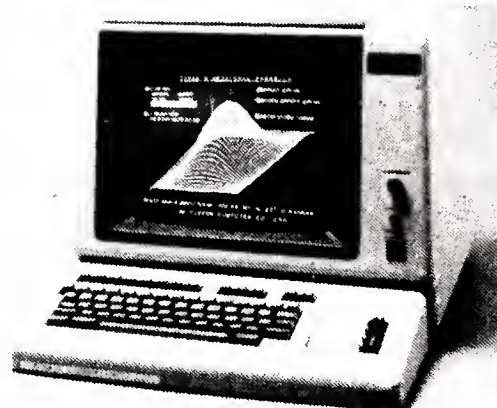
TOKYO — The Nippon Computer Co., Ltd. has announced a graphics terminal designed for business graphics, graphics information re-

trieval and some computer-aided design and manufacturing and computer-aided engineering.

The NJC-M1212 terminal contains a high-resolution monitor, graphics processor, communications package and keyboard and takes up approximately 2.5 square feet of desk space, according to a vendor spokesman.

The terminal includes a 12-in. green CRT, 640- by 486-dot resolution and three communications ports.

It lists for \$2,600. More information is available from the vendor at Naito Building, Nihonbashi Hamacho 2-25-1, Chuo-ku, Tokyo 103, Japan.



Nippon's NJC-M1212 Terminal

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3270 BISYNCH
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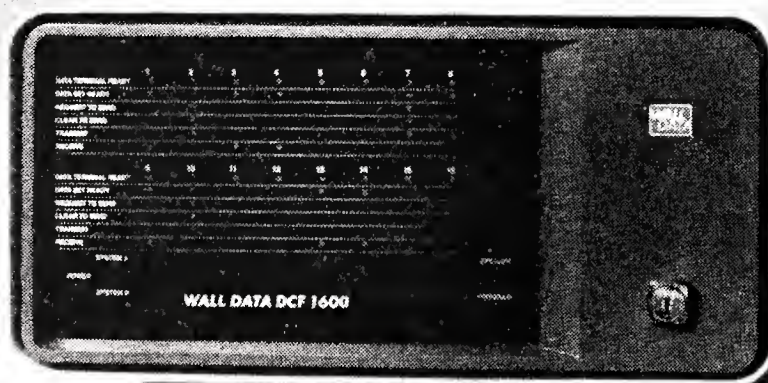
change. Adding or changing software is as easy as dialing the Wall Data Technical Support group. No costly delays to disassemble equipment. No unplugging and replugging PROMS. Just a 5 minute call and Wall Data will reconfigure your system to your new specifications.

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Teletype Unveils Four Terminals

(Continued from Page 57)

ments scheduled for the fourth quarter of 1983.

Joining the fray of countless other terminal manufacturers, Teletype will also introduce an IBM 3270-compatible terminal said to support the IBM protocols Systems Network Architecture/Synchronous Data Link Control and Binary Synchronous Communications.

The Model 5540 includes a 5¼-in. floppy disk drive for controller programming, device identification and options. A dual microprocessor-based controller can cluster up to 32 devices, a vendor spokesman said. The detachable keyboard features 24 programmable function keys.

The price of the controllers for the 5540 will range from \$4,500 to \$11,500. A cluster configuration, consisting of one controller, four terminals and one character printer will sell for \$13,234. Shipments are set for the third quarter of 1983.

A third terminal can be divided into as many as four addressable work spaces or can be horizontally split into two work spaces. The Model 5420 also features a scroll mode to allow the user to scan all 72 lines of available memory and a page mode that splits the memory into three separate 24-line pages.

The 5420 is an Ansi 3.62-based asynchronous display with eight system-defined function keys that can be downline-loaded from a host and eight user-defined function keys entered locally. Column widths that can be changed for spreadsheet applications and line drawing graphics are also featured.

The 5420 will cost \$1,495, with shipments beginning in the third quarter of 1983.

A fourth, low-end terminal will also be introduced for applications such as time-sharing, inquiry response, data retrieval and software development. The Ansi 3.64-based conversational terminal features eight programmable function keys and on-line capabilities such as horizontal split screen, editing and line drawing graphics, a vendor spokesman said. It will be available in the third quarter of 1983 for \$995.

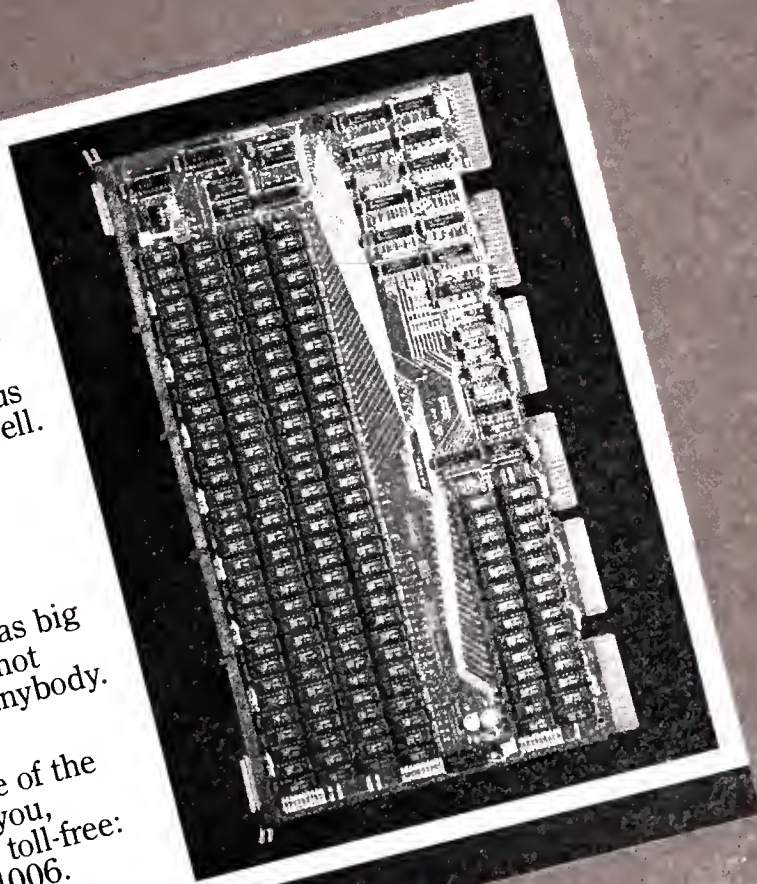
More information on these products is available from Teletype Corp., 5555 Touhy Ave., Skokie, Ill. 60077.

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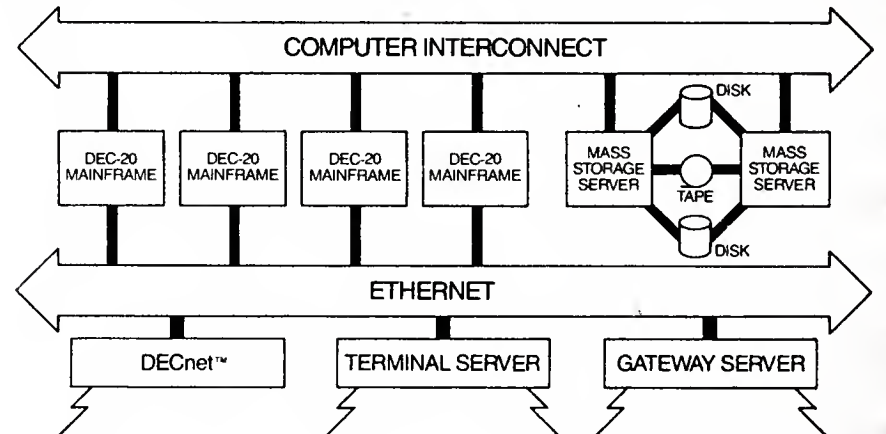
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so you save both space and money. Redundant data paths protect against lost information. And all data access is transparent to the user.

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MZ-68K Interface Board Allows SNA/SDLC Link

CONCORD, Calif. — Thomas Engineering Co. has introduced an interface board said to allow 32 asynchronous communications lines to connect to an IBM host under Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC).

The MZ-68K, when accompanied by the vendor's SNA firmware, is said to add SNA capability to any multibus-compatible product, including dumb Ascii terminals, intelligent instrumentation and local-area networks such as Xerox Corp.'s Ethernet. The firmware, MZ-SNA, is priced at \$1,000, according to a spokesman for the vendor.

DXM-96 Module Eases Interaction

CHAMPAIGN, Ill. — Compre Comm, Inc. has introduced a 9,600 bit/sec modem module for its Data Xchange field-expandable statistical concentrator and network processor series.

The DXM-96 is said to facilitate on-line, real-time interaction between terminals and a remote computer over a single terrestrial or satellite link. The module is a V.29-compatible modem card that may be added to the Xchange systems in the field, the vendor said. It was designed to be used in full-duplex, point-to-point applications over non-conditioned lines.

The modem module is available for \$2,300 from Compre Comm, 3200 N. Farber Drive, P.O. Box 3570, Champaign, Ill. 61821.

Discount Offered On G-1000 Unit

COSTA MESA, Calif. — Genisco Computers Corp. has announced volume discounts for its G-1000 high-resolution graphics terminal.

Volume discounts are available for up to 35% off the \$9,950 purchase price of the G-1000. In addition, the vendor announced that an alphanumeric display feature, formerly an option, is now standard on the G-1000. The firm also reduced costs by 40% for memory expansion boards.

The vendor is located at 3545 Cadillac Ave., Costa Mesa, Calif. 92626.

Study to Focus on Fiber-Optic Tech

BROOKLINE, Mass. — Information Gatekeepers, Inc. (IGI) has announced a study of fiber-optic communications that will concentrate on fiber communications technology and applications for local networks.

Titled *Opportunities in Local Fiber Communications: Telephone, Cable TV and Lans*, the study will evaluate local telephone service, cable television and private local-area networks.

Directed at equipment suppliers, telephone firms, cable TV operators, investors and users, the study will assess which U.S. markets fiber-optic communications will penetrate first, at what scale and with what implica-

A complete protocol conversion system is available from \$9,120 for eight asynchronous lines to \$14,120 for 32 lines.

More information is available from Thomas Engineering, 1040 Oak Grove Road, Concord, Calif. 94518.

Dial-Up Lines Get Security

PALO ALTO, Calif. — Digital Pathways, Inc. has introduced a computer access security system said to protect dial-up data lines.

The Defender allows traditional computer log on procedures, but provides two additional protection schemes by functioning as an authorization point through which each user must receive clearance prior to accessing the computer, a spokesman for the vendor said.

The system can be installed on any host computer with no software or hardware modifications, a vendor spokesman said. It is capable of addressing up to 59 simultaneous users at speeds up to 9,600 bit/sec.

Configured for 14 outgoing lines, the system is available for \$14,975 from Digital Pathways, 1060 E. Meadow Circle, Palo Alto, Calif. 94303.

Modems Offer Short-Haul Link

WOODBURY, N.Y. — Remark Datacom, Inc. has introduced two short-haul modems said to use two twisted-pair wire for bidirectional, full-duplex transmission of data at 9,600 bit/sec up to distances of 10 miles.

The Models 73 and 74 Remotely Controlled Short-Haul Modems allow the transmission of one control signal in each direction, in addition to full-duplex data.

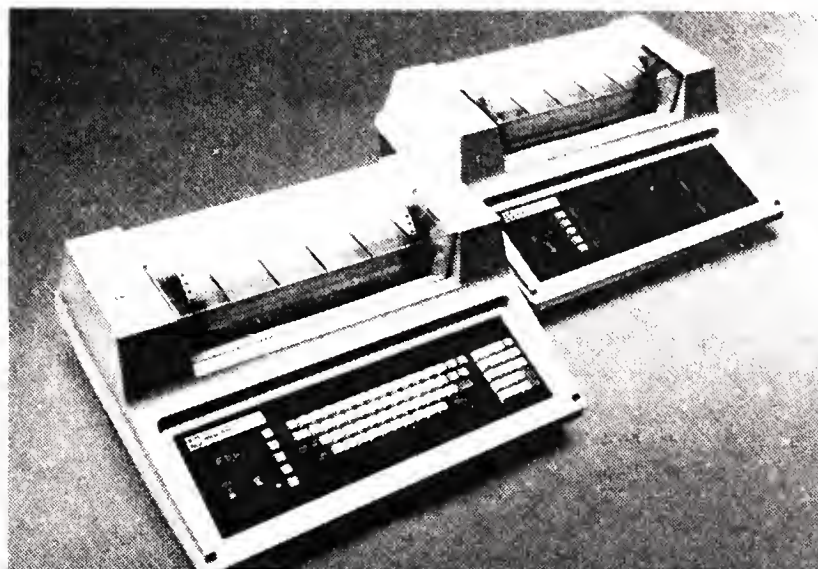
Applications of this series include using the control signal to drive an annunciator at the remote modem indicating required attention or by looping back the control signal at the remote modem via a mechanical switch or logic, a spokesman for the vendor said.

The Model 73 is available for \$99 and the Model 74 for \$110 from Remark Datacom, 4 Sycamore Drive, Woodbury, N.Y. 11797.

tions for suppliers and users. It will also assess the role of market factors, including technical standards and U.S. and international product developments.

Six volumes will comprise the final study: an executive summary and market forecast, a technology/supplier assessment, separate market assessments for the three target markets and an analysis of business strategy options.

The study, available in December, is priced at \$22,000 for coverage of all three markets and \$12,000 for coverage of any one from IGI at 167 Corey Road, Brookline, Mass. 02146.



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With Two-, Four-Port Models

STC Expands Mux Line

WALDWICK, N.J. — STC Systems, Inc. has announced two additions to its Communication Multiplexer line.

The two-port Model 224 slave multiplexer was designed for the customer who requires only two interactive terminals with a data rate of 1,200 bit/sec. The four-port 1,200 bit/sec Model 424 master multiplexer can support four interactive terminals and is upgradable to support eight interactive terminals, a vendor spokesman said.

The units were designed to allow up to eight remote terminals to share a single telephone line. Terminals can be located in the same building, in different buildings or in different cities, a vendor spokesman said.

The Model 224 costs \$2,300 plus \$20/mo maintenance, and the Model 424 costs \$3,200 plus \$30/mo maintenance from the firm at Four North St., Waldwick, N.J. 07463.

Micro Attachment Unveiled

CINCINNATI — A microcomputer hardware/software attachment said to add Burroughs Corp. TD830/MT983 and B-20 emulation capabilities to the Apple Computer, Inc. Apple II+ and Apple III microcomputers has been introduced by Midwest Data Source, Inc.

The Burple is a communications system said to provide integrated asynchronous, synchronous direct-

CHAMPAIGN, Ill. — Data Communications Brokers, Inc. has introduced two models of the Link MUX multiplexer said to have two channels plus error correction for Bell Laboratories 212 dial-up modems.

The Link MUX Model S is avail-

able for synchronous links of up to 9,600 bit/sec, according to a spokesman for the vendor.

Model A is for 1,200 and 2,400 bit/sec dial links. For 212 modems with autodialers, Model A allows the user to command the dialing to establish the call, according to a vendor spokesman.

Both models are priced at \$795. More information is available from Data Communications Brokers, 3000 Research Road, Box 3715, Champaign, Ill. 61821.

Sumicom Option Fits System 830

TUSTIN, Calif. — Sumicom, Inc. has announced a new communications option for its System 830 business personal computer.

The new option reportedly allows users to tap into on-line data bases, including The Source and CompuServe Information Service. It also allows users to send and receive telex and TWX messages through RCA Corp.'s global communications service, Globcom, according to a spokesman for the vendor.

The new option consists of software and an internal modem, which connects to standard telephone lines, a vendor spokesman said.

The price for the option is \$995. More information is available from the vendor at 17862 E. 17th St., Tustin, Calif. 92680.

Protex Offers Signal Booster

DENVER — Starnet Data Systems Division of Protex Industries, Inc. has announced an RS-232C-C/V.28 signal booster said to replace extended distance cables, modems and line drivers for extending cabling distances.

Starbooster reportedly acts as both a line conditioner and signal booster that receives signals from the originating device, regenerates them, reduces noise, corrects the electrical characteristics and retransmits to the next receiving device.

Usable in synchronous and asynchronous communications, the unit is available in fail-safe mode or high-noise immunity mode. Each model costs \$110 from the firm, which is located at 1331 W. Evans Ave., Denver, Colo. 80223.

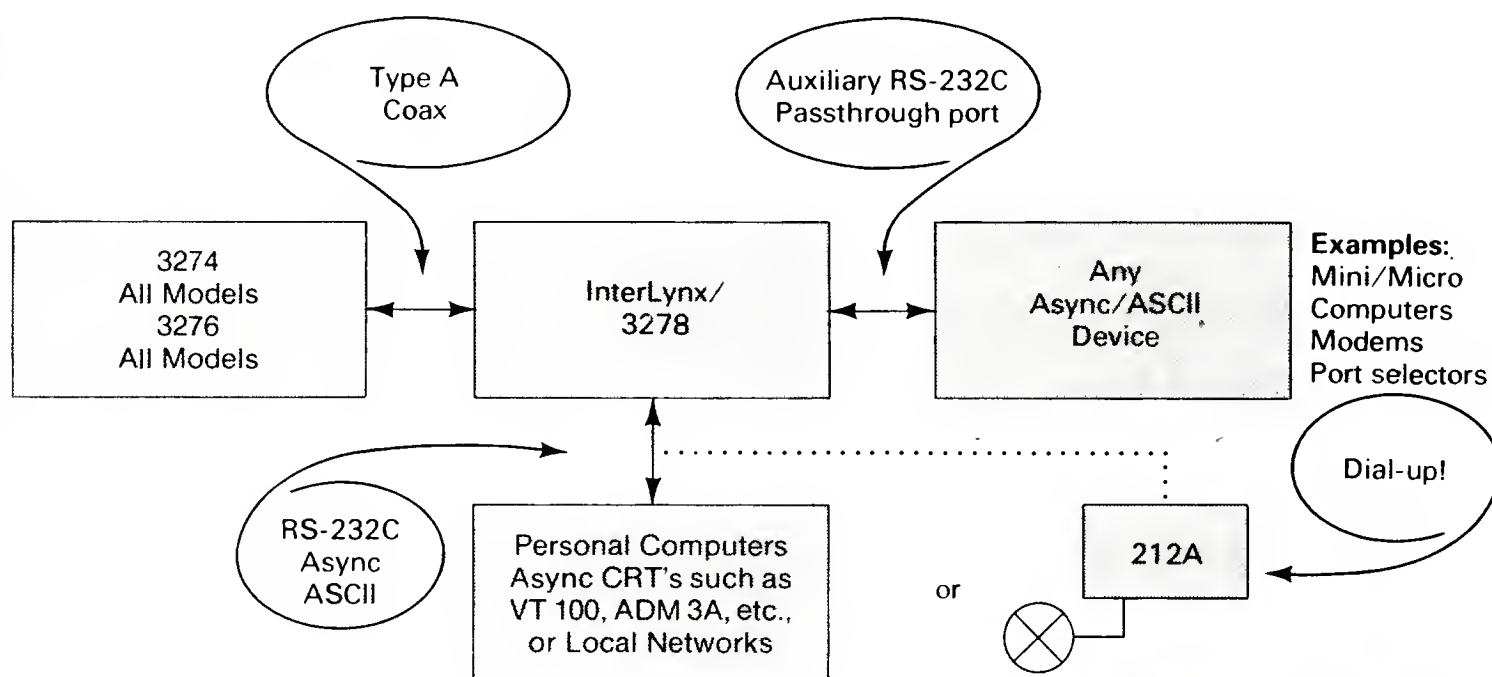
Inmac Announces EIA Line Driver

SANTA CLARA, Calif. — A full-duplex asynchronous line driver said to transmit virtually error-free data up to 15 miles has been introduced by Inmac Corp.

The EIA Line Driver converts data into low-level signals that travel easily over telephone wires, according to a vendor spokesman. At the 15-mile range, data transmission is from 0 to 1,200 bit/sec. At distances up to four miles, rates move up to 9,600 bit/sec.

The self-testing unit is available for \$195 from Inmac, 2465 Augustine Drive, Santa Clara, Calif. 95051.

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- Async ASCII to IBM Type A coax conversion.
- 3278 native mode emulation with P.C.'s, async CRT's or hardcopy terminals.
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- Local or remote BSC/SNA attachment.
- Async dial support on channel-attached IBM 3274.
- File transfer package for IBM PC (\$200).
- 25 primary async ASCII terminals supported, 50 secondary terminals.
- PC support for IBM PC (\$60), HP-120/125, Apple II/III, Compaq, Xerox 820, VT-180, Rainbow, Osborne, TRS80 II, etc.
- Menu selection of 3278 async pass-through and configuration mode.
- Options stored in electrically erasable PROM.
- User initiated disconnect for Micom or Develcon switch.
- Word processor support for Xerox 860 and IBM Displaywriter.
- \$1750 (Quantity discounts and OEM pricing on request).

The InterLynx/3278 is a standalone protocol controller that allows an async ASCII CRT or personal computer to attach to IBM 3274/6 controllers in emula-

tion of the IBM 3278-2 display terminal. The InterLynx/3278 connects to the IBM Type 'A' coax port and converts the coax interface to an RS-232C ASCII interface.



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IN DEPTH

By Dick Smith

When a computer system and its users interact at a pace that ensures that neither has to wait for the other, productivity soars, the cost of the work done on the computer tumbles, employees get more satisfaction from their work and its quality tends to improve. Few on-line systems are this well balanced; few executives are aware that such a balance is economically and technically feasible.

In fact, many managers think that a relatively slow response time of two seconds is acceptable because terminal users need some time between transactions to think up their next entry. However, research on rapid response time now indicates that terminal users do not

operate this way. In fact, productivity increases in more than direct proportion to a decrease in response time.

With better response time and more terminals, the following results have been achieved:

A few seconds saved here and there can build to represent large dollar amounts. An IBM specialist in on-line systems explains.

- A fivefold increase in output per application developer.

- Reduced project costs.

- Increased out-

put quality and quantity.

- Large dollar savings.

Almost any type of computer user can achieve significant productivity gains by optimizing service. For one user, the National Institutes of Health, the benefits from increased productivity were 15 times the cost of the improved service.

The information systems department

A Business Case For Subsecond Response Time

FASTER IS BETTER



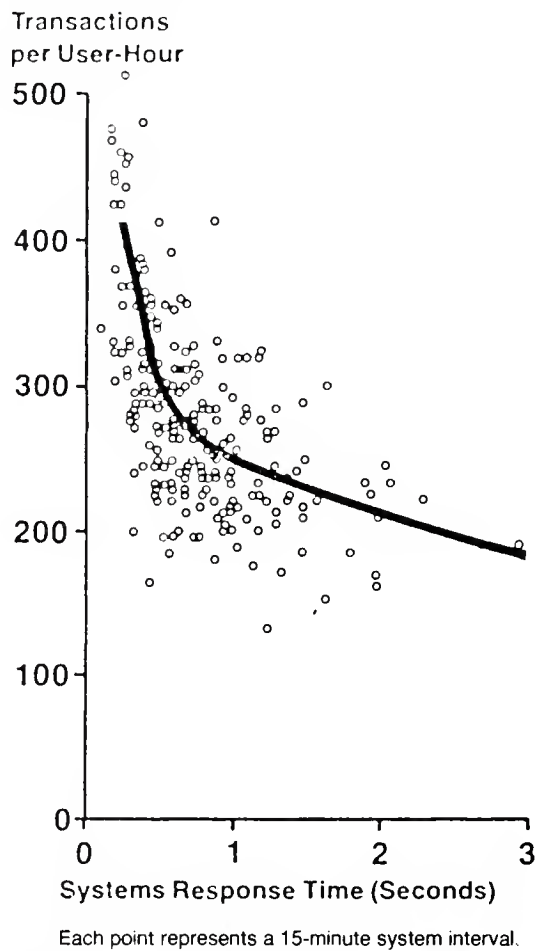


Figure 1. Interactive User Productivity Study

and user management should be aware of the studies and various essential facts on improved service levels in order that they may together develop appropriate plans and actions for implementation. The purpose of this article is to demonstrate a way to choose a more cost-effective method of optimizing service levels that will increase productivity for your organization.

Service levels can be improved in the following ways:

- By decreasing system response time. The largest productivity gains are realized with subsecond response time.
- By increasing system accessibility. For example, easy access to terminals for all users and individual terminals for active users can dramatically improve accessibility.
- By improving availability of the complete system (function/application, network and data base) to the users. For instance, if the communications lines fail, the user may not have system access even when the host system is available.
- By improving system reliability — extending the time between service failures.
- By decreasing the average time

of interruptions caused by system failures.

- By decreasing batch turnaround time.

There is a synergistic relationship between system response time, availability, accessibility and reliability. Optimal productivity requires that these four elements all be at excellent levels. For example, the value of subsecond response time is greatly enhanced if there is also easy access to the system. Thus, it is cost-effective to balance service-level components.

Interactive User Productivity

Several studies indicate that decreased response time is a factor in raising productivity levels. Walter J. Doherty, IBM Research Center, was one of the first to see the significance of large improvements in system capacity. In the first subsecond response time study, Arvind Thadhani, an advisory engineer at IBM's General Products Division headquarters in San Jose, Calif., found that programmers and engineers significantly increased their productivity as response time improved from five seconds to one second. Even more remarkable was the increase in produc-

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tivity for subsecond response time (see Figure 1).

These improvements were much greater than could be accounted for solely by the improved system response time. Thadhani found that user response time varied with system response. In fact, the user response time dropped almost three times as fast as the system response time in the range between .3 and three seconds.

Psychologists explain this think time reduction in terms of a person's short-term memory. When on-line users enter a given transaction, they usually have two or three more transactions in mind. With subsecond response time, they immediately enter the next transaction. However, if they are interrupted by a long system response time, their mind may wander and cause them to forget what they intended to enter. This disruption is believed to contribute significantly to the longer user think time accompanying longer system response time.

A longer and more erratic response time usually causes people to slow down in their work and to become frustrated — which results in more mistakes.

Thus, reducing the system response time can accelerate user response time to a much greater extent than we expected and produce dramatic productivity gains.

Application Development Study

We have discussed productivity so far in terms of transactions per user-hour. How can this terminal connect time affect the users' entire day? Does it allow a person to finish a project earlier? Is output quality maintained? Geoffrey Lambert of IBM UK conducted a study to investigate how much the benefits of improved service apply to the programming development process.

Study and control groups were set up. The application contained about 50% on-line and 50% batch applications. The project size was estimated by one method and checked for reasonableness by two other methods. This size estimate was important because it was to be the basis of improvement for the project. The estimate was made using the standard IBM Information Systems technique "Managing the Application Development Process." The reasonableness checks used were:

- A function points estimate, which is similar to lines of code, except it is not influenced by the programming language.
- An estimate based on the actual effort required for a similar application.

It was estimated with a high degree of confidence that the project would take 31 person-months.

Each of the on-line programmers in the study group had a terminal, whereas in the control group, 1.8 users shared a terminal. The response time for the study group averaged

.84 seconds as opposed to 2.22 seconds for the control group. This better response time was provided by giving the study group local terminals and higher priority TSO service.

Project Scope

The study project scope spanned about half the project — from pseudocode up to systems test. This included pseudocode, unit test and integration test. The other phases, since they were included as part of

the total project, could not be split out and measured separately. The control group consisted of all other developers on the system.

The measured results showed that the control group had a throughput rate of 161 transactions per user-hour and the study group was almost 100 higher at 258 — a 60% improvement in transaction rate. The study group's productivity, as measured by the functional code produced per developer-month, increased by 58%.

Will the quality of the work product deteriorate as service levels improve? Some managers fear that users might let the terminal and the system do a lot of the work, like finding syntax errors, and users could become lazy. However, in this study, the code quality, function points per error, improved 130% to 33.6 function points per error from 14.5. This improvement could also be stated as a 57% reduction in error rate.

However, only eight errors were

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detected during the study group's system test. Since the number of errors was so small, the results are subject to large variance.

This test indicates that code quality could be maintained or improved with improved service levels. However, additional tests would be required to state the degree of improvement more precisely. In any case, the study group not only produced more code, but much higher quality code.

The application developers attributed this improved code quality to the ease of using the system. Users would get on the system to make minor changes, such as changes in documentation, which they might normally leave until their next terminal session. They also stated that they checked more, rather than guessing, for such things as data set names.

The question is, how does this affect the entire project? It was finished in 61% of the estimated time.

Improved service levels had an extremely important impact on the productivity of these on-line users. In fact, their overall productivity was directly related to the transaction rate they achieved during their terminal sessions. Finally, the bottom-line cost of doing the project decreased 37% for the study group. These costs included the developers' time plus the system time they used.

The morale of the study group improved considerably over the control

group. The study group saw the machine as an aid to letting them do their job better. They also saw the satisfaction of completing work in one session and getting a lot more work done in a single session. Having their own terminals was an important factor in their results.

The study team members were moved from their normal workstations to a common room with locally connected terminals. This move made it easier for them to concentrate on their work and communicate with each other.

They preferred to move with the project team, as opposed to staying in a permanent work location.

The work quality was improved primarily because faster response time made it easier to build in quality. In addition, users started to do more functions at the terminal. Project manager Lambert predicted an increase in on-line functions as the users became accustomed to individual terminals with high service levels. He felt they would do more documentation at the terminal and use more of the interactive aids than they did before.

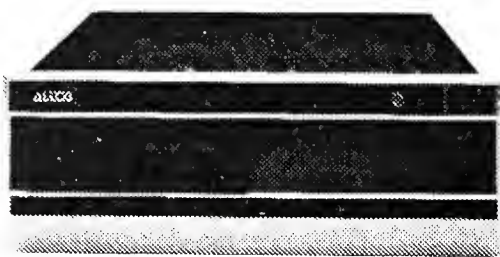
In this application development study, the primary benefits for the worker were increased satisfaction and improved morale. The work itself was done at a unit cost some 37% lower. The value of the work comes from completing projects earlier and completing more projects. If we assume the study results could be achieved on an ongoing basis, 64% more applications, of improved quality, would be completed each year.

Another surprise that came out of this study was that the number of CPU hours used for the two groups was identical. The study group took 19 person-months to consume their 30 CPU hours, and the control group took the equivalent of 31 person-months to consume this time. It appears that a critical factor in project

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completion was how fast the on-line users could gain access to the CPU time they required to finish the job.

In other words, the on-line users require a fixed amount of system resource to complete a task. If this resource was consumed faster, the users completed their task faster.

To summarize, the Thadhani study showed that subsecond response time results in dramatic increases in transaction rates. The application development study showed that subsecond response time and individual terminals affect total user output. In fact, total user output increases just as much as the transaction rate; that is, doubling the user transaction rate doubles the total user work output.

The following case studies show that this phenomenon generalizes to other areas.

Engineering Study

The discussion now turns to a very different type of on-line user, the high-function graphics person (who uses a light pen to design circuits, for example). This work is characterized by a higher transaction rate — up to 4,500 transactions per hour in this study.

In this experiment, IBM separated the novice user and the expert performer from the group to determine how each was affected by the response time. The novice user improved from approximately 60 transactions per hour at a 1.5-second response time to 650 transactions per hour at a .25-second response time. This is an 11-fold improvement. The top performer, on the other hand, worked at 800 transactions per hour at a 1.5-second response time but soared to 4,300 transactions per hour at a .4-second response time — a 550% improvement.

These are limited samples, but they do show that novice, average and expert users all can benefit considerably from improved response time.

NIH Study

Saving a few seconds of a person's time here and there may seem insignificant, but these seconds accumulate rapidly and build to represent large dollar amounts, large enough to more than justify the cost of installing a larger processor if one is needed to provide more rapid system response. The National Institutes of Health (NIH) provides an outstanding illustration.

In 1979, NIH's installed system was designed to offer 300 simultaneous users word processing, programming, computing and remote job entry capabilities, with the response of 80% of the transactions being processed in .5 seconds or less. Terminal work sessions averaged 95,000 per month. At its design level, the system had functioned to the satisfaction of its users, but increasing demand was threatening its ability to continue providing an acceptable

'Studies show that subsecond response time results in dramatic increases in transaction rates. In fact, total user output increases just as much as the transaction rate; that is, doubling the user transaction rate doubles the total user work output.'

level of service.

The number of simultaneous users had grown to almost 400 and was

projected to be 500 in 18 months.

With 390 users, the computer response time had deteriorated to an

average of four seconds and the time to complete an average task had increased 50% from 32 to 48 minutes.

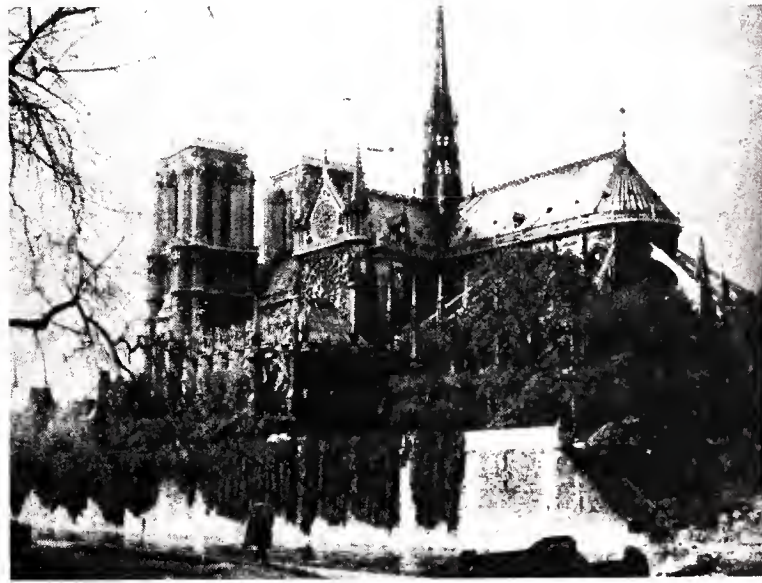
To solve this problem, Joseph D. Naughton, chief of the NIH computer center, proposed to upgrade the processor. He had observed that system deterioration was causing the NIH's users to spend an additional 22,500 hours at their terminals each month, yet they were accomplishing the same number of tasks.

The system and user cost for this

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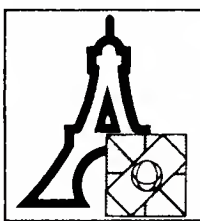
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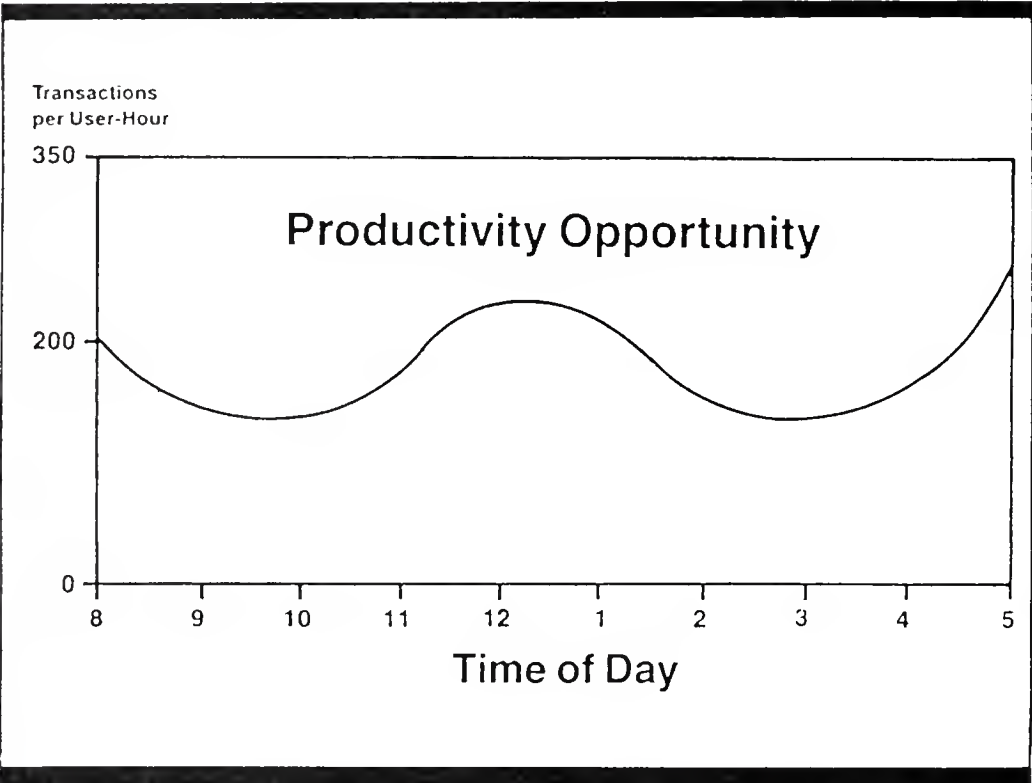


Figure 2. Transaction Rate vs. Time of Day

time were estimated at \$900,000 monthly, 15 times the incremental cost of a new processor capable of providing subsecond response time to 500 simultaneous users. For NIH, the cost of upgrading its processor was more than justified by the sav-

ings in user time and the restoration of low task costs.

Applying Study Conclusions

Improvements in interactive user productivity have occurred in a variety of areas within IBM and at cus-

tomers installations as well. Improvements have been observed for programmers, engineers, professionals, secretaries, administrators, clerks and managers. The phenomenon appears to be general, rather than applicable only to a narrow group of users. All of these studies show a real productivity improvement with improved service levels.

To optimize service in your organization, the following steps are recommended:

- 1. Measure current productivity.
- 2. Select target service levels.
- 3. Calculate the benefits of optimizing service.
- 4. Determine the best alternatives for achieving your target service levels.
- 5. Calculate the cost and benefits of the alternatives and select the most favorable.

Measuring Current Productivity

For Time-Sharing Option (TSO) systems, a Resource Measurement Facility (RMF) report or its equivalent provides the key productivity measure of transactions per user-hour. This measurement is calculated by dividing the number of TSO transactions by the average number of users, times the duration of the RMF report. All the numbers required for the calculation are found on the RMF printout. For example:

$$\frac{80,000 \text{ TSO transactions}}{100 \text{ active users} \times 8 \text{ hours}} = 100 \text{ transaction/user-hour}$$

First calculate transactions per user-hour for one day's prime shift. Then compare your rate to the rates obtained in the studies discussed. This step can be done in less than a half hour.

Next, calculate transactions per user hour for each RMF prime shift interval. This will show the user productivity changes across the day.

This plot can be produced in about two hours. Figure 2 is an example of this plot for one TSO user group. Transactions per user-hour averaged 175 with peaks of over 200 transactions per user-hour. The higher rates were achieved in the early morning, lunch time and late afternoon when the response time was faster.

Several days of prime shift data may now be examined to obtain a larger sample size which will assure greater accuracy in the results. This larger sample may be analyzed by either or both of the two methods described above. A Thadhani curve, illustrated in Figure 1, should also be plotted with this data.

Network Response Time

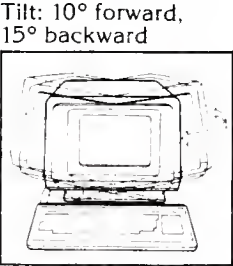
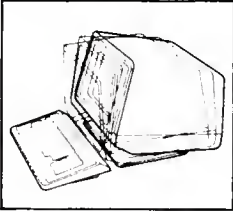
RMF provides only the central system response time. For locally attached terminals, this may be very close to the total response time. However, for terminals operating over communications lines, the communications delay is probably significant and worth measuring. To measure the total response time at the terminal, the following technique could be implemented.

I have searched for at least 10 years for an easy, inexpensive technique to measure complete terminal response time. My search has not been in vain. At an IBM installation I found such a technique, which had been used successfully for three years to:

- Measure TSO response time.
- Monitor network performance.
- Track against service levels.

The technique issues a TPUT hold command in the TSO logon user exit. The TPUT hold sends a transmission to the terminal and requests that the terminal acknowledge receipt. The TPUT hold is timed and the elapsed time is recorded. This measured time has been verified by the installation to approximate closely the network

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Productivity Measures	User Groupings		
	A	B	C
Transactions per user connect hour	100	200	400
Connect hours per user day	1	1.5	2.5
Batch turnaround to terminal (minutes)	30	20	5
Users per terminal	4	3	1
System availability (%)	90	95	98
System response time (seconds)	5	1.5	0.5
Overall Measure			
Transactions per active user per day	100	300	1,000

Definition of terms in Interactive Productivity Index:

- **Transactions per user connect hour** is obtained from RMF or its equivalent by dividing total TSO transactions per hour by the average number of logged-on users.
- **Connect hours per user day** is the prime shift connect hours for each active TSO user. It may be calculated by multiplying the average number of prime-shift logged-on users by the number of daily prime shift hours divided by the total number of equivalent active users.
- **Batch turnaround to terminal** is the time from job submission until the output is available for the user on the terminal.
- **Users per terminal** is the average number of active users sharing a terminal.
- **System availability** is the average percent of prime shift hours that TSO is running and available to the users.
- **System response time** is the time measured from depression of the Enter key to the display of the response. Transactions included are the fastest 90% to 95%.
- **Transactions per active user per day** is a measure of overall productivity. It is calculated by multiplying transactions per user connect hour by connect hours per user day.

Figure 3. Interactive User Productivity Index

'Application development users operating at 100 to 150 transactions per hour are dissatisfied. As they approach 200 transactions per hour, their complaints diminish. In many cases, they could move to 400 transactions per hour and produce many more applications.'

response time for a typical TSO transaction. Several TPUT holds may be issued for a larger sample size and greater accuracy.

The timing data may be recorded on the SMF data set or a separate file. Response time reports may then be produced for terminals, terminal control units, lines and so on. Network response time may be combined with RMF TSO response time to give total terminal response time.

Setting Reasonable Targets

Application development users operating at 100 to 150 transactions per hour are dissatisfied. As they approach 200 transactions per hour, their complaints diminish. The question is: Are they productive at the maximum level? In many cases we have studied, indications are that they could move to 400 per hour and

produce many more applications and enterprise benefits.

The index in Figure 3 represents the wide range of TSO productivity measurements from 15 user organizations. Listed are three groups representing different levels of TSO use and user productivity. Note that user groupings B and C are entering three and 10 times as many transactions per user day respectively as user grouping A. Based on the studies discussed, one could estimate groupings B and C would produce three and 10 times the output of A.

The productivity measures on the chart appear to be the prime contributors to the "overall measure" of transactions per user per day.

Benefit Analysis

By measuring current productivity and selecting new targets, you

	3/80	8/82	Opportunity
Response time (sec)	8	1.5	.3
Terminal ratio	6	3	1
Transactions/user hour	90	200	400
Connect hrs/active user day	1	2.1	2.5
Transactions/active user day	90	422	1,000
User cost/month for connect hrs	\$190,400	\$511,700	\$933,333
Relative productivity	\$190,400	\$1,137,000	\$4,148,148
Transaction rate benefit/mo.		\$625,300	\$3,214,815

Figure 4. Benefit Analysis for One User

have identified an opportunity for improving on-line productivity. The question now is: How do you calculate the benefits of increased productivity? A benefit method based on the "transaction-rate vs. time-of-day" plot may be used.

In the example plot (again see Figure 2), the average number of transactions currently entered is 175 per hour. The target number of transactions selected is 350 per hour. If the users enter the transactions twice as fast, they need only one hour rather than two to enter 350 transactions.

Thus, one hour of terminal user time is saved for each hour used at the new rate. These hourly savings are summed for all users and multiplied by the hourly cost of a user to obtain the total benefits.

User Example Profile

At a large New York bank, the TSO users are within the information systems organization. The user departments are application development, quality assurance, operations, systems programming, net-

work control, management control and end users. Four hundred users were determined to be the active users, those who used more than four hours of connect time per month.

Figure 4 shows benefit analysis data from March 1980 to August 1982. The data is from RMF and capacity planning reports.

Note that service levels improved considerably over this interval.

- Total response time at the terminal improved from eight to 1.5 seconds.
- Terminal ratio improved from six to three active users per terminal.
- Transactions per user-hour increased from 90 to 200.
- Connect hours per user-day more than doubled in going from one to 2.1 per active user.

In August 1980 these users were entering transactions more than twice as fast as they did at the beginning of the study. Therefore, they needed only one hour rather than 2.2 hours to enter 200 transactions, which resulted in savings of \$625,300 per month. This benefit is

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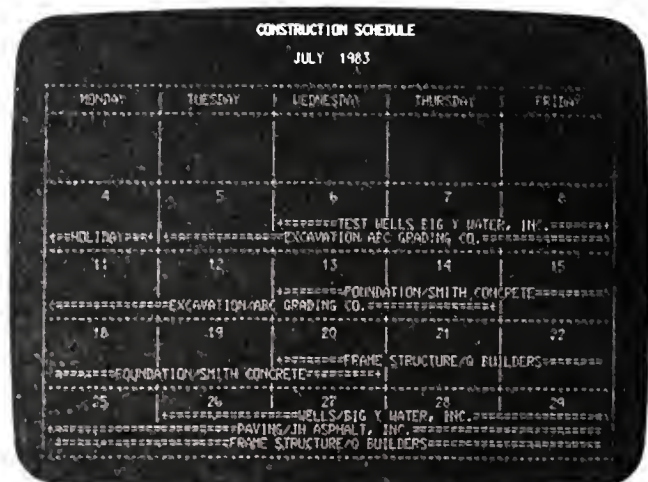
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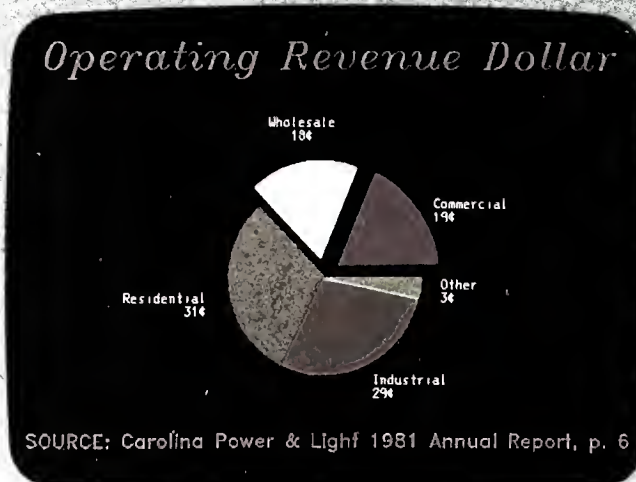
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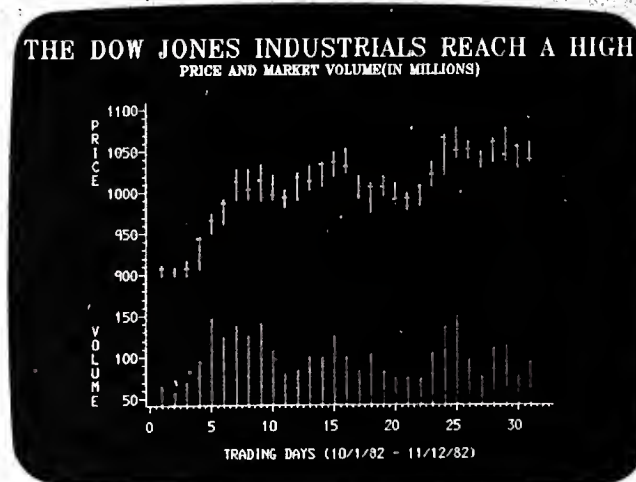


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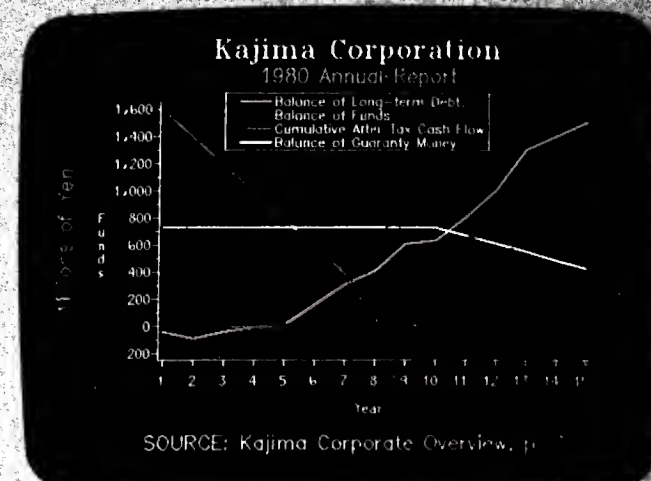
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LESS RETURNS AND DISCOUNTS	(1,000)	(1,000)	(1,000)	(1,000)
NET SALES	121,000	114,170	111,000	109,000
TOTAL COST OF SALES	120,000	113,000	110,000	108,000
GROSS PROFIT	1,000	1,170	1,000	1,000
OPERATING EXPENSES	(82,350)	(81,500)	(80,000)	(79,000)
OPERATING INCOME	38,650	32,670	31,000	30,000
OTHER INCOME/EXPENSE	500	200	1,000	1,000
TAXABLE INCOME	39,150	32,870	32,000	31,000
INCOME TAXES	(9,400)	(8,200)	(8,000)	(8,000)
NET INCOME	29,750	24,670	24,000	23,000

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FOR 1983

BEER TYPE	Q1 1983		YTD 1983		AVERAGE
	SALES	PERCENT	SALES	PERCENT	
LAGER	1,126,24	15.37	1,158,11	15.14	1,142,18
BREW	14,211,54	19.41	14,005,50	18.75	14,108,52
PREMIUM	24,017,44	32.34	24,002,62	31.66	24,010,03
OTHER	3,022,49	4.08	3,042,04	4.05	3,032,26
TOTAL	7,267,71	98.84	7,208,27	98.60	7,238,04

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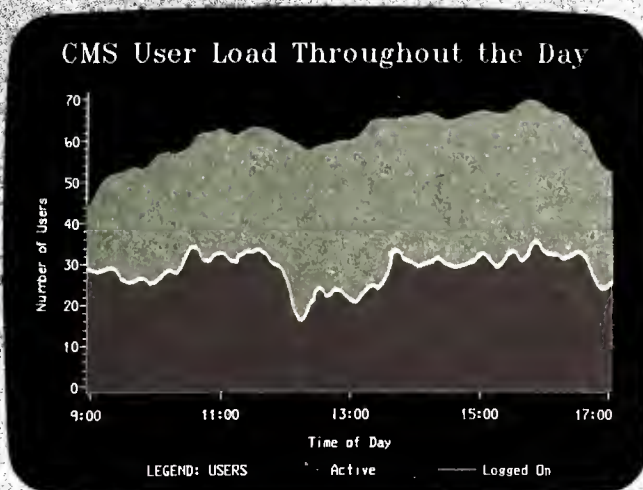
First Quarter (1983) Analysis Fiscal Year Screen

Command ==> _

DEF MODE

UNIT	SALES	PERCENT	TIME	PERSONS
Units Sold (all products combined)				
USA	50	250	100	50.00
Europe	10	50	20	10.00
Asia	40	200	80	40.00
Total Units	100	500	200	100.00
Sales (all products combined)				
USA	655	250	1310	51.85
Europe	101	35	202	7.47
Asia	540	100	1079	40.24
Total Sales	\$1.2M	\$385	\$2,591	\$4,272
Operating Costs				
USA	225	1125	450	72.73
Europe	35	80	70	19.47
Asia	160	10	320	19.80
Total Oper Cost	\$420	\$1,215	\$840	\$2,475

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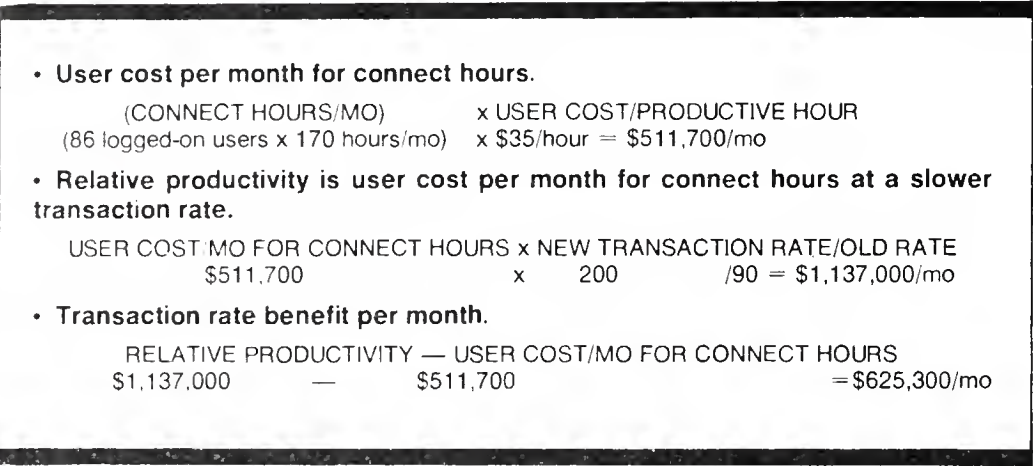


Figure 5. Calculating Monthly Benefit

the difference between current user cost per month for connect hours and relative productivity, that is, user cost per month for connect hours based on the previous rate of entering transactions. The benefit more than offsets the additional cost of providing the improved service.

Calculating Benefits

This example shows a monthly transaction rate benefit of \$625,300 for August 1982. This benefit was calculated as shown in Figure 5.

Even greater benefits appear to be possible. Several TSO installations are processing more than 1,000 transactions per user day, compared with 422 in the example. These installations typically have a response time

of .3 seconds, a terminal for each active user and excellent TSO system availability. Users enter transactions at 400 per hour for 2.5 hours per day to achieve a rate of 1,000 transactions per user-day.

If the users are entering transactions more than four times as fast (400 rather than 90 transactions per user-hour) they need only one hour rather than more than four to enter 400 transactions. This user time savings results in a \$3,214,815 monthly benefit (see Figure 4).

Based on the studies presented here, one would expect the total work output of the on-line user to increase in direct proportion to transactions per user-day. This is precisely what happened. Transactions per

Productivity Report
Percentile range 0% to 95%

Sample Interval	Response Time (sec)			Active User Count	Trans/ User/ Hour
	Host	Network	Total		
1000-1005	0.4	0.6	1.0	64	263
1005-1010	0.5	0.6	1.1	66	235
1010-1015	0.5	0.7	1.2	75	201

Figure 6. Vtam Pars II Report (Selected Fields)

user increased 4.7 times and total work output increased five times. This user organization is realizing five times the work output from application developers plus a \$7,500,000 yearly benefit because of more productive terminal time.

Defining Service Alternatives

The desired service levels may usually be reached by different paths. Solutions should consider all parts of the system. Options that might be considered are:

Network options for faster response time and better availability:

faster lines, dedicated lines, microwave, leased vs. dial-up, faster modems, local terminal connection or moving systems and users together.

Terminal options for better user access to the system: individual terminals for active users and/or improved terminal access for all users.

Memory and I/O subsystems options for reduced response time and improved throughput: larger main memory, I/O control units with caches, dedicated control units or dedicated I/O.

Main processor options for increased throughput, better handling

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of peak loads, availability and so on.

"Creative alternatives" sessions will undoubtedly generate more options.

The question to examine is whether the benefit dollars will outweigh the cost of improved service. If so, prepare the business case.

Extensive service optimization has been applied to VM environments. This procedure is quite similar to the one described for TSO. It can also be applied to many other interactive environments, such as IMS and CICS. The new release of Vtam Pars II allows measurement and reporting of user productivity data (see Figure 6). This permits an organization to determine the effect of service levels on user output and optimize user productivity.

To apply any of the techniques discussed here, use the following steps:

1. First review the studies: the Thadhani study on the effect of response time on productivity and the application development study.

2. Measure user productivity at your installation. Most of the information you

need for this is available in RMF (or an RMF equivalent).

3. Once you have collected the data, calculate the potential benefits, much as in the example.

Also compare your organi-

zation's productivity measurements with those in the Interactive User Productivity Index.

4. Determine the best service alternatives and pursue the high-leverage areas.

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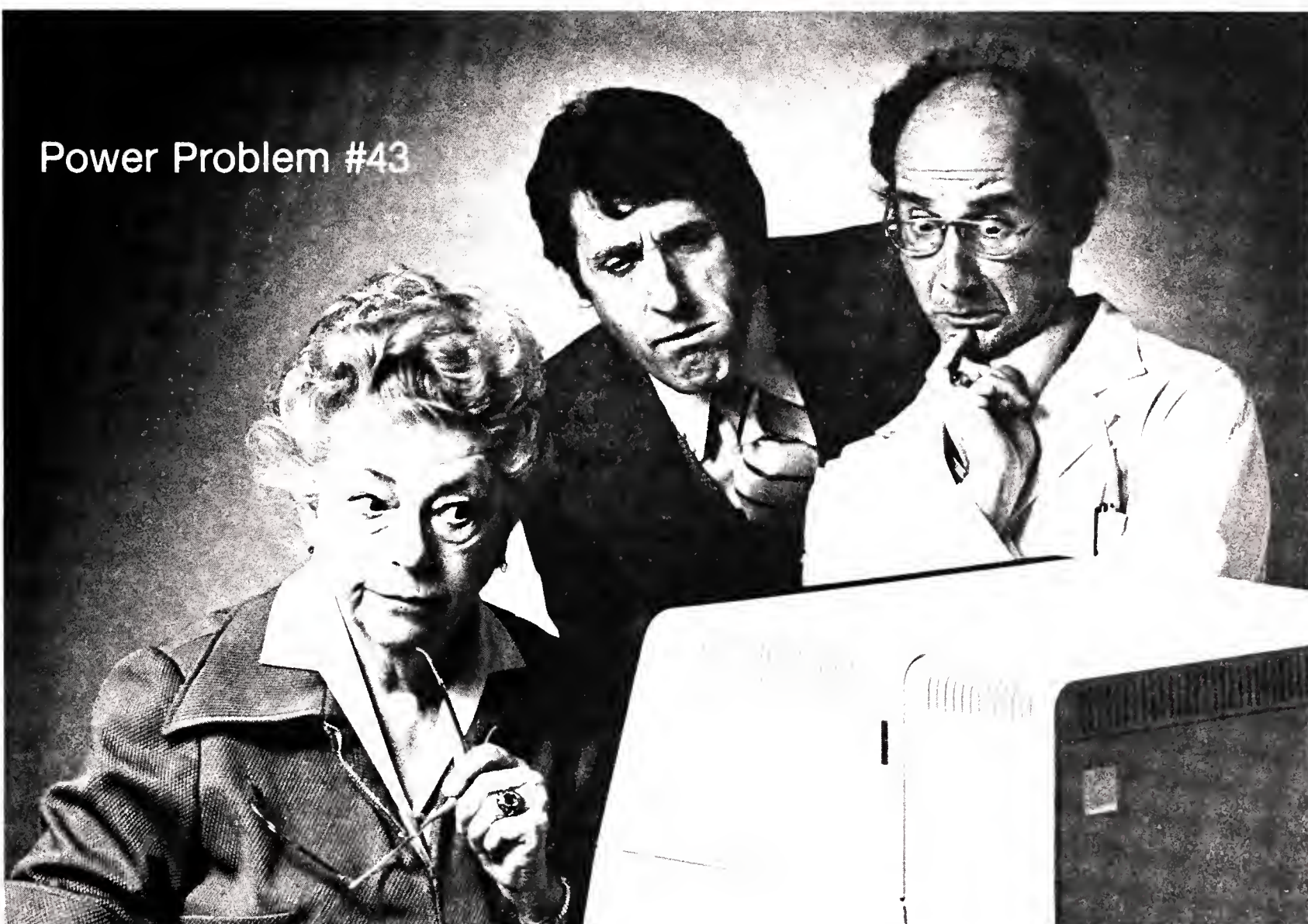
A.J. Thadhani, "Interactive User Productivity," IBM Systems Journal 20, No. 4, 407-423 (1982)

"The Economic Value of Rapid Response Time," IBM Pub. GE20-0752.

"Online Service Optimization TSO Measurement," IBM Account Marketing Programs.

"TSO User Benefits from Online Service Optimization," IBM Account Marketing Programs.

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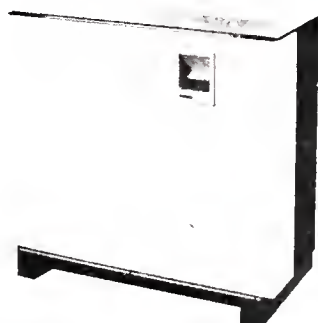
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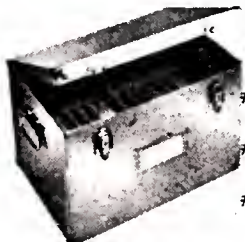
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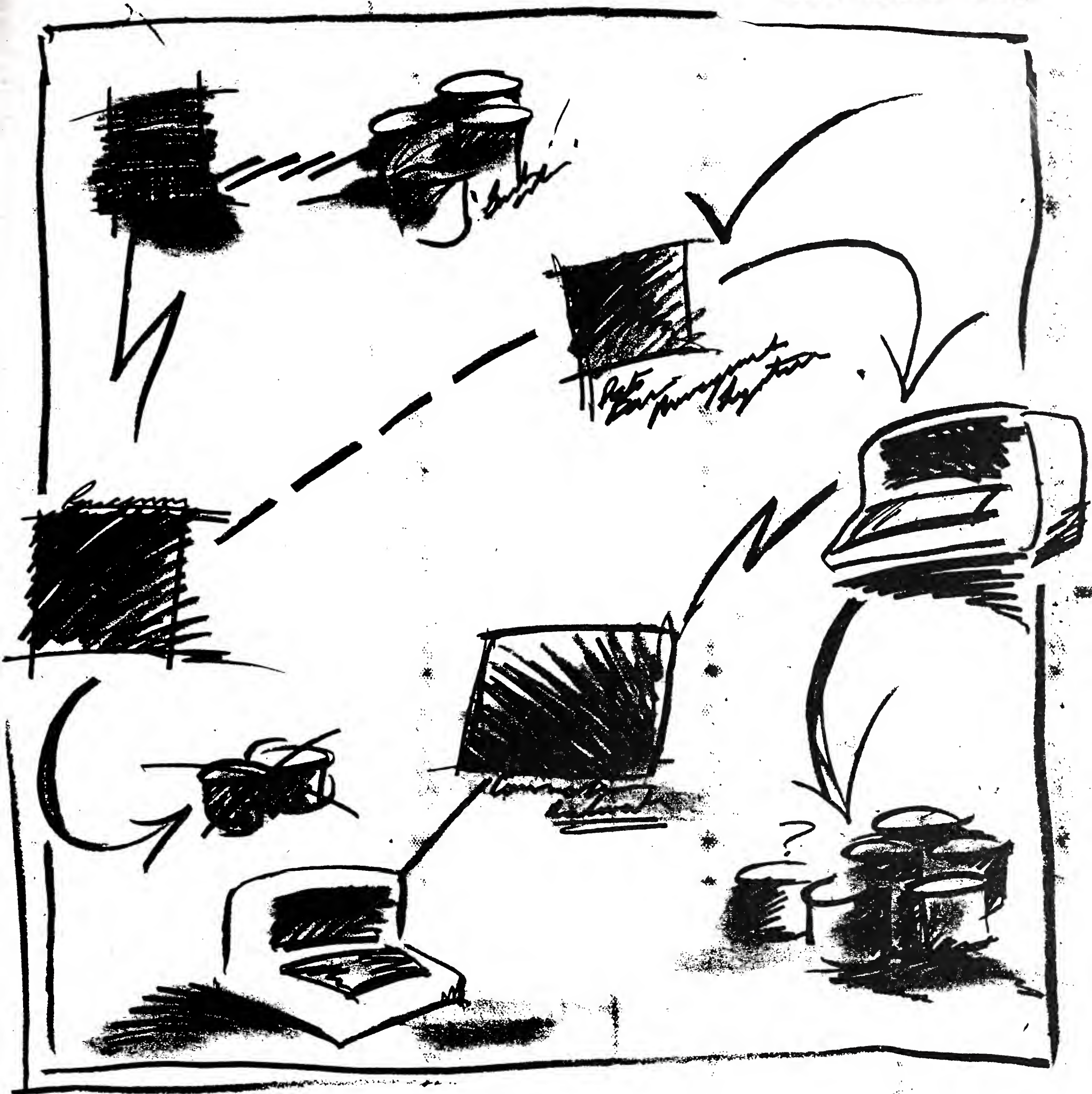
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THE ART OF PLANNING DISTRIBUTED DATA BASES

BY ROBERT H. HOLLAND

Businesses today are facing a formidable challenge in trying to integrate their data resources. The organization of the 1970s spent between 1% and 3% of sales on data handling, while today the figure is 5% to 8%. By the end of this decade, the total is expected to approach 12%. Not only are the volumes of data stored in corporate data bases on the increase, but user requests for data are becoming more complex.

For these reasons, one of the most critical areas in corporate planning is data base planning. Companies all over the world

are struggling to develop data base plans. A few are learning to do it correctly, and the rewards are great. Others are failing miserably. Many with no cohesive plan generate their data bases "bottom up" in the organization. Management somehow expects them to fit together magically as they evolve.

Top management must take part in establishing a strategic data base plan. One of the first decisions in building the plan is to determine the level of integration the organization needs. Multiple data bases may be used to support different types of busi-

ness activities. The data bases will be expected to communicate with each other and, in various ways, be combined to support an application request.

The data bases of a company become a shared resource. While different departments may create data, use it, read it and manipulate it, no part of the company owns data.

Management must decide the level of data base cross-referencing and usage required early in the planning

process. Data bases may be integrated at various levels.

Some companies want to establish corporatewide data bases while others want division data bases. One popular and very workable approach in multidivision organizations is to create corporatewide data bases for the support areas, such as accounting, finance and personnel and division-integrated data bases for the production and marketing areas. There are as many variations on level

of integration as there are companies implementing them.

A sound agreement can be reached by top management and the decision displayed by means of a functional chart as shown in Figure 1. This very high-level overview of business functions is then completed in greater detail. Marketing may be further divided into the functions of sales, advertising, market research, distribution and so on. The production area may be broken into ware-

housing, production scheduling, product engineering and materials management.

The completed diagram is management's statement regarding the level of data integration the company requires to operate effectively. The data bases established for the functions may be expected to stand and support all applications needed by those functions.

The company must next develop a strategic data model for each function, depicting the major groups of data needed to run the organization on a daily basis. These broad groups of data are known as data entities. The strategic data model is a map that associates entities to business activities and processes, and finally to business functions, as defined in the integrated plan. Business processes may be thought of as a group of actions that perpetuate a business function. For each function shown in Figure 1, a set of business processes may be defined. In addition, each business process has a set of specific business actions referred to as business activities which much be completed on a continuous basis in order to achieve the objectives of a process.

Both small and large companies have developed strategic data models that consist of approximately 30 business functions, 250 business processes, 1,000 business activities and 200 data entities. The business activities specified in Figure 2, for example, should be directly associated with systems plans, and the entities of Figure 2 must directly influence the data base plan.

If a company has between 2,000 and 10,000 entities or data classes in its data model, the company has not used the proper entity identification and naming conventions. Closer inspection of the data model will most likely indicate a significant amount of redundancy among the data classes. The entities should be cleaned up and reduced to the approximately 200 that are necessary.

Subject Data Bases

Companies generating successful data base environments have implemented subject data bases — not application data bases. If data bases are designed by a project team from the bottom up in order to fulfill the requirements of a particular application problem, the result will almost always require significant reworking. As the company adds new applications to the systems processes that require the same data, the old application data structures never seem to fit the new requirement. As a result, it is not unusual to see a company developing approximately 75 to 150 application data bases over a six-year period. Redundancy in these data bases is running rampant, which literally destroys data integrity.

Subject data bases create a more stable data environment. The first task in establishing these data bases is to identify the subjects of interest

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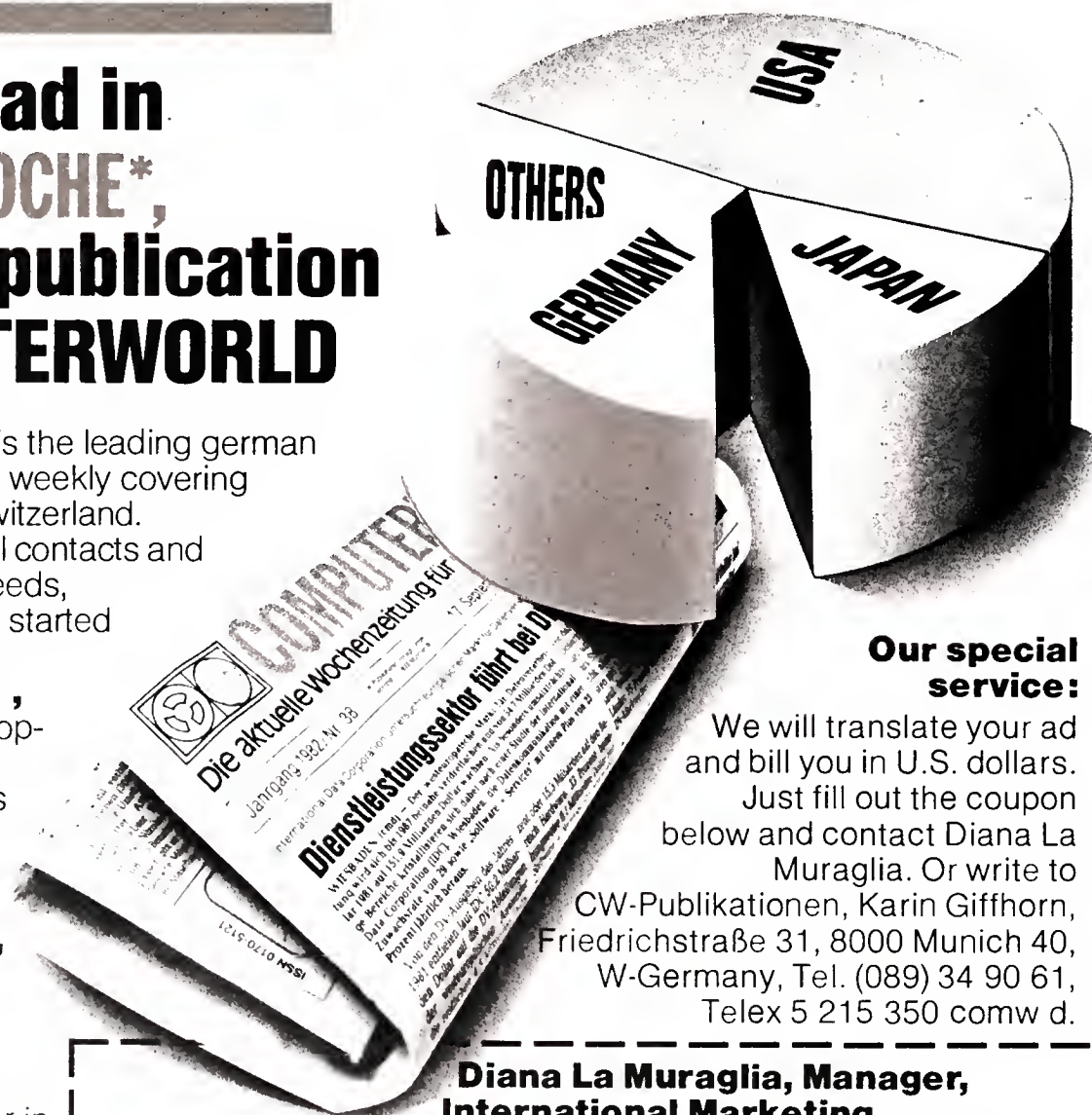
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in a corporation. The strategic planning process provides those basic subjects through the data model.

Subject data bases consist of groups or clusters of a company's data entities. In grouping entities, homogeneous entities should be clustered into the same subject data base so as to maximize intra-data base associations and minimize inter-data base associations based on the company's business activities and distributed data base requirements. This may be accomplished through statistical techniques that help the data base designer cluster entities. Once the entities are clustered into each subject area, they may be named. The entity-to-entity relationships may be established within each data base and between data bases.

The identification of subject data bases from the strategic data model

provides a quick, top-down blueprint of the broad data groups needed to support the business activities. Every entity will consist of two or more data elements. The data elements need not be, and should not be, established at the time the subject data bases are identified. All data elements and their detail relationships should be developed bottom-up as project designs are necessary.

In considering the distribution of subject data bases, a planner should estimate its feasibility according to the location, business transactions, traffic patterns and physical characteristics of the data. He should look at several methods of distribution and analyze the capabilities of a data base management system (DBMS) to handle distribution.

Subject data bases are extremely easy to maintain. Everything about

an employee, contract or supplier is within its own data base. For maintenance purposes, the user does not have to worry about splitting entities apart within the data bases for new applications. This approach affords the advantages of tackling the implementation of data bases on a piecemeal basis and establishing new entity relationships without changing old ones. Good subject data base environments may be established with 20 to 30 subject data bases, but they

vary in content, size and relationships depending on the user.

Data bases such as those shown in Figure 3 (on In Depth/17) may be distributed in a number of different ways. They may be centralized in a single hardware environment or distributed to remote locations.

Data Base Strata

The corporation that wishes to distribute data must develop an overall approach for controlling and manag-

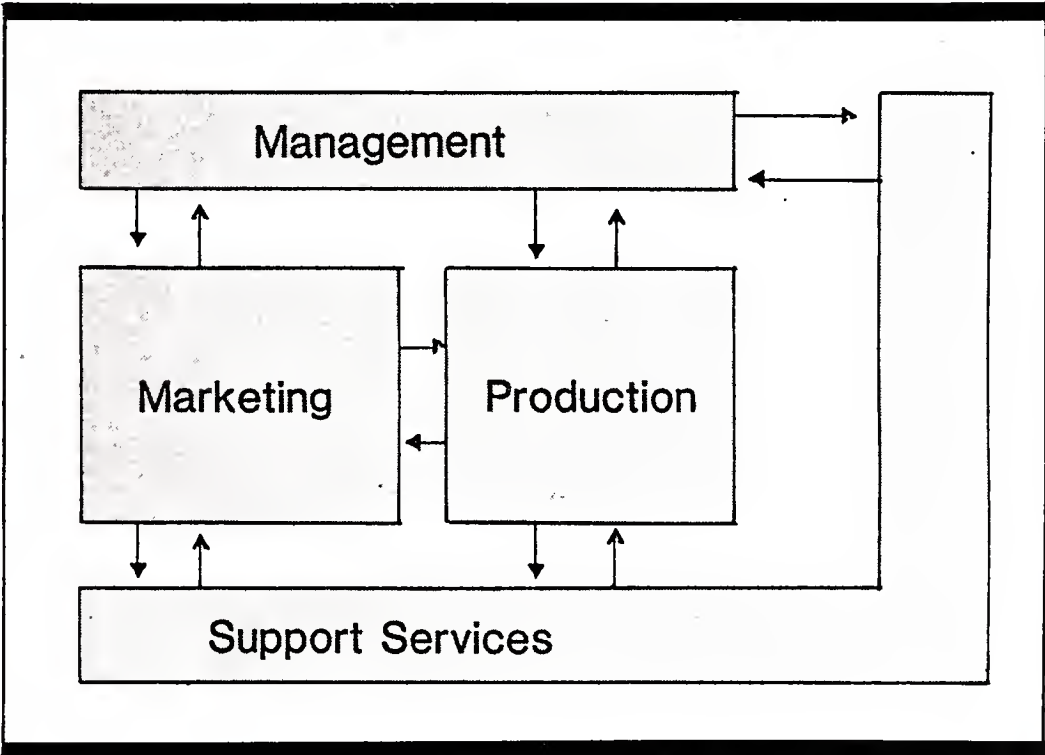


Figure 1. Overview of Business Organization

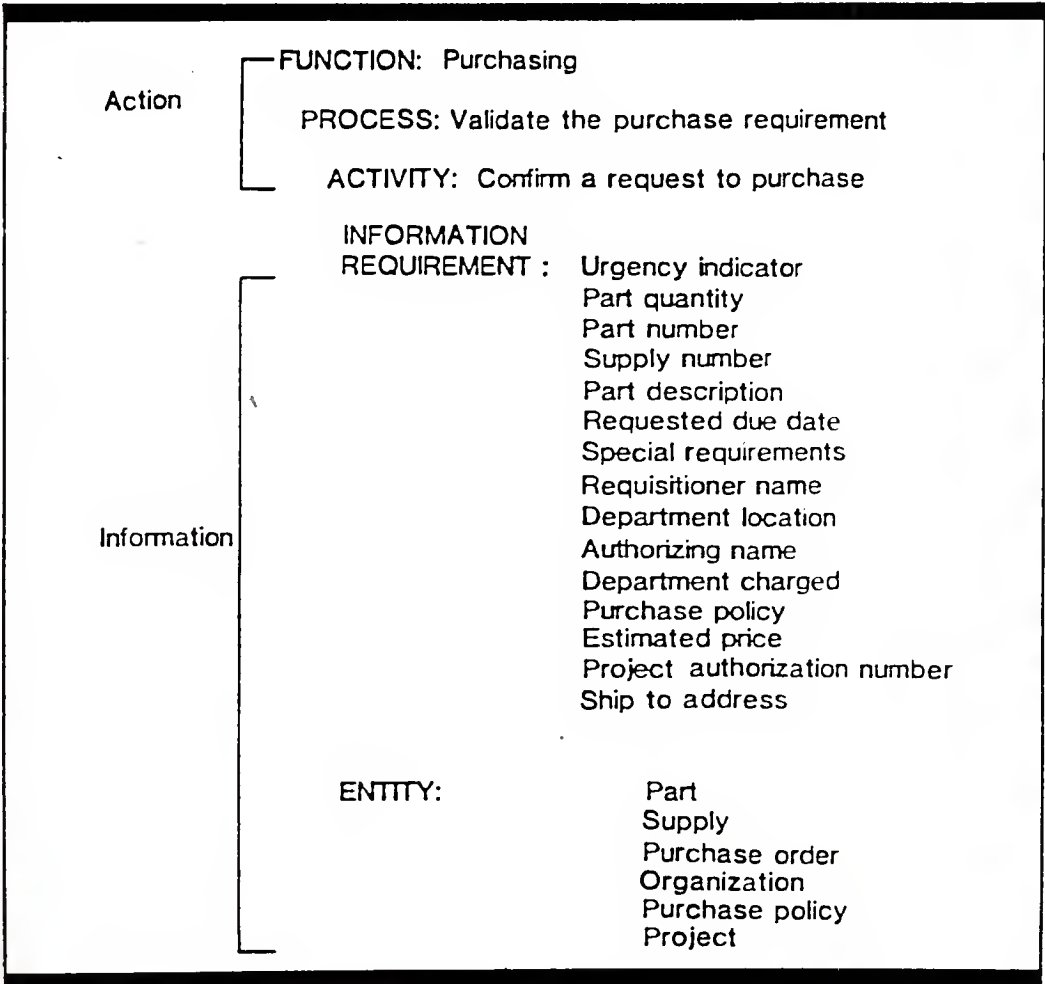


Figure 2. Breakdown of the Purchasing Function

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ing the data because today's software and hardware architectures do not automatically take care of all anomalies that can exist in a distributed data environment.

The management strategy in a distributed data environment is to develop the strata of data bases that are required to support a particular company or business unit. The key to selecting the right technique is to develop a top-down view of the data base strata and then determine how

much distribution the company can handle.

In considering degree of data distribution, users must strike a balance between transmitting data and storing it in peripheral units. As a rule of thumb, the more widely dispersed corporate data locations are, the more attention must be paid to transmission costs and reliability of the transmission facility between the locations. On the other hand, the closer the data locations, the more atten-

tion must go to the peripherals that hold the data.

Using this rule and considering only cost, we can investigate the trade-off between multiple storage units and transmission to a centralized unit of data.

In North America, the trend is toward more highly centralized data since transmission is relatively efficient and fairly inexpensive. On the other hand, in many foreign countries, transmission is fairly expensive

and quite often breaks down.

With decreasing costs in storage, as well as decreasing transmission costs, we can expect the relative arguments of decentralization vs. centralization to remain the same over the coming decade.

However, it is also necessary to consider other factors in making the distributed-vs.-nondistributed decision. For example, if the technology costs permit, it often makes sense to store data where it is used. Therefore, the company business model must also include the location of a particular corporate site that uses data for every activity performed.

While in a shared data resource environment no one part of the organization owns data, various parts of the company create data, others read it and still others have the authority to update it. The real issue then becomes one of who needs the data most often and for what purpose.

The circumstances that naturally lead to decentralization may be stated as follows:

1. Data is primarily used at one peripheral location. It is rarely, if ever, used at other locations. Transmission of such data for storage at remote locations may be unnecessarily complex and expensive.
2. The accuracy, privacy and/or security of data is a local responsibility.
3. The data bases or files are simple and used by one or only a few applications. Thus, there may be no reason to use DBMS software that may require large computing resources at the remote site.
4. The update rate for the data bases involved is too high for single centralized storage.
5. Remote data bases are interrogated or manipulated with an end-user language such as an engineering graphics system, statistical analysis routines or linear programming packages, which result in unique and highly specialized uses of the data. Too many end-user operations with this type of data can destroy the performance characteristics that all users of a centralized system want. Data may be better located in a peripheral data base environment where the end users are responsible for their own usage and costs in analyzing the data through various special-purpose software packages they may have available.

The major arguments for a centralized data base approach are as follows:

1. The data is used by centralized or shared applications such as payroll, accounting, material requirements planning and production scheduling. In such organizations, the shareability of data across multiple applications is so important that a distributed facility would be impossible to invoke considering all the protocols needed to support such an environment.
2. Users in all functional areas of the company need access to the same

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Custom Mode	Yes	No	No	No	No
Keyboard LED's	Yes	No	No	No	No
25th Status Line	Yes	Yes	No	No	No
2-Speed Smooth Scroll	Yes	No	No	No	No
Graphics Characters	Yes	Yes	No	No	No
Configurable Print & Send	Yes	Yes	No	No	No
Set Up Mode	Yes	Yes	No	No	Yes
Settable Tabs	Yes	Yes	No	No	Yes
Choose Protected Attribute	Yes	Yes	No	No	No
Screen Saver	Yes	No	No	No	Yes
Alternate Character Generator	Opt.	No	No	No	No
2 Pages of Memory	Opt.	No	No	No	Opt.
Amber Phosphor	Opt.	No	No	No	No
Plot 10 Graphics from Manufacturer	Opt.	No	No	No	No
Warranty (Days)	365	90	90	90	90

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data, but also require an up-to-the-minute version of the data. In this case, the data is frequently updated and may be centralized in order to avoid the problems of real-time synchronization. The synchronization problems are tremendous in environments that require multiple copies of data with frequent updates that are used by several organizations within the company. For systems requiring this type of support, one should avoid decentralization at all costs.

3. Corporate users require data from many separate locations, and it is cheaper to centralize their data than to use a switched data network.

4. With the software available today, it is extremely time-consuming to search data that is geographically scattered. The software and hardware for efficient searching through ad hoc queries require secondary indexes. Such indexes refer only to the data stored in one location. Thus, for reasons of efficiency and complexity, DBMS software operates today on centralized rather than on geographically scattered data. This situation is expected to change dramatically during the latter part of this decade, but corporate strategies cannot live on promises.

5. In cases where a high level of data security through standardized security techniques is to be maintained over data, centralization is the approach to use. Such protection may be acquired through the centralized knowledge of data administration which invokes data authorization at the data element level, segment, set or relational level, record level and/or data base level. Such authorization requires centralized knowledge of the data and these techniques. In other words, data administration in the organization must fully learn about these security techniques before decentralizing such knowledge.

The same arguments can be applied to catastrophe protection for data. In these cases, the decentraliza-

tion is primarily for purposes of backup and recovery from a disaster that might occur rather than for decentralized use of the data on a daily basis.

6. Some companies require tremendous amounts of data storage. They use marketing techniques or design techniques that require millions of customer records, product design records and research experiments. In these cases, economies of scale that take advantage of centralized bulk storage are desirable.

7. Most systems are more easily audited when their detail usage is centralized. This often requires detail transaction audit trails which are stored in large centralized archival storage units.

The degree to which a company may distribute data should also depend upon the sophistication of its DP staff. As it decentralizes, it must have professionals with a solid background in communications protocols as well as data base and integrated software technologies. Such talent may be difficult to acquire or maintain, and many companies should more strongly consider centralizing their data. Exceptions to this rule would be the banking industry, travel agencies and customer service industries in which data is a major part of the business. These companies will have to raise or acquire the right DP professionals to do the job.

Methods of Data Distribution

Most systems with geographically dispersed data are file systems rather than well-controlled distributed data base systems. More than one DBMS may exist within a company or perhaps a copy of the DBMS exists, but each one resides in its own CPU facility and generally has no direct control over the DBMS that resides in other facilities.

Exceptions include Cullinet's IDMS, with resident monitors and virtual monitors, and Computer Corp. of America's SDD.1. Both em-

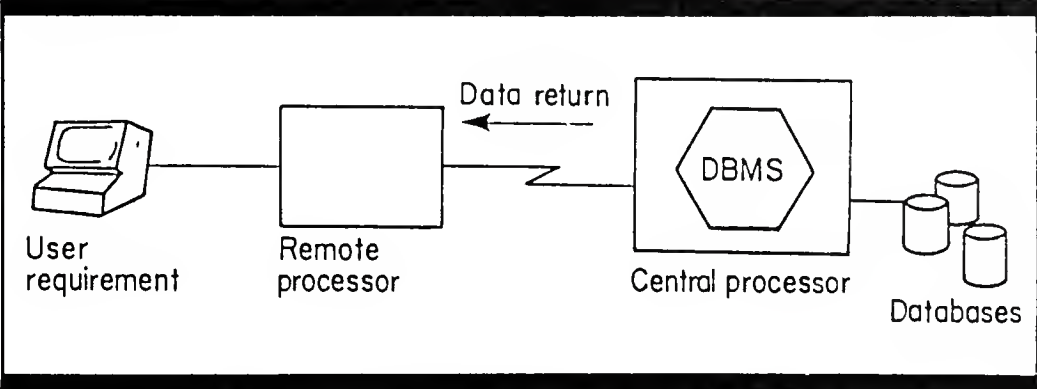


Figure 4. Remote Processor Environment

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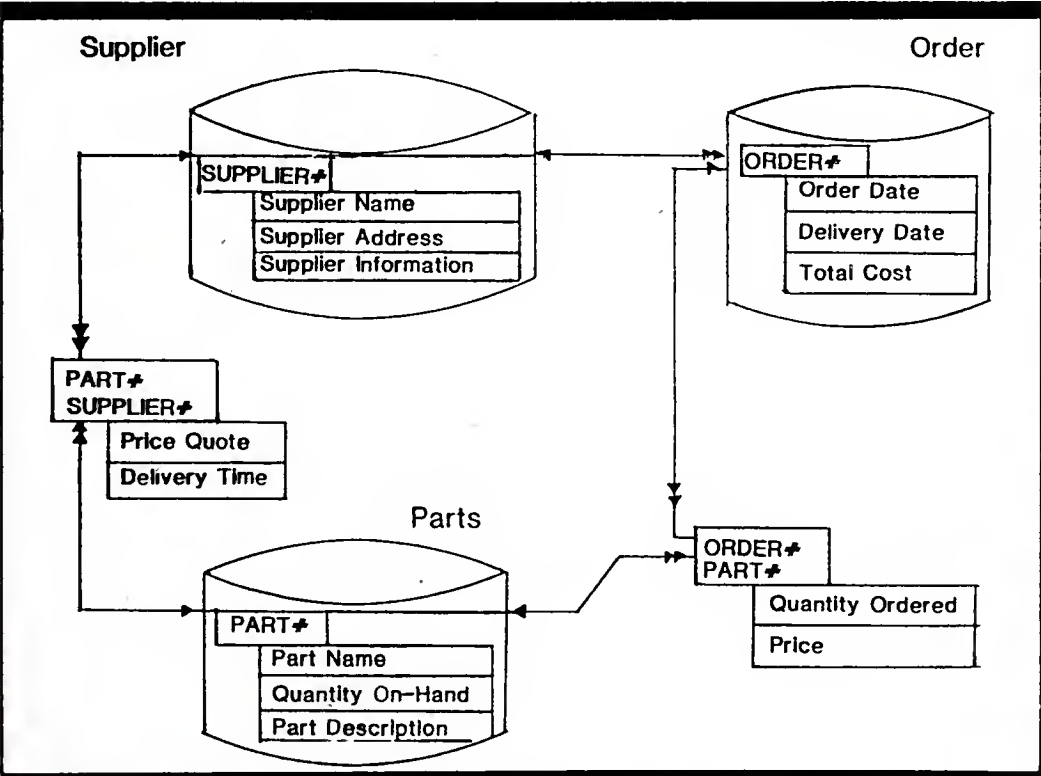


Figure 3. Subject Data Bases

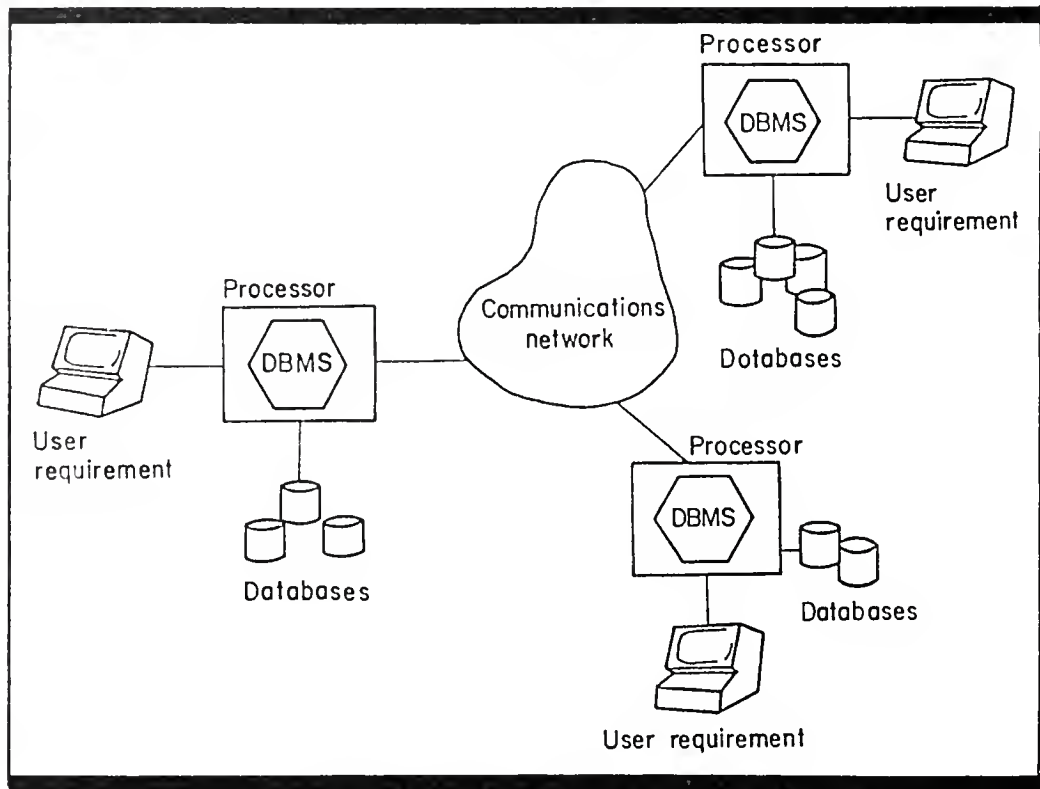


Figure 5. Multi-DBMS Network

ploy a local data manager that controls the conventional functions of the DBMS and a separate network manager that does not access the data itself but does determine the access strategy for handling distributed data operations efficiently. These are

as close as we have come to distributed DBMS, but they have strong centralized control over distributing the data and handling the necessary communications protocols. There is no freewheeling node capability with constant communications be-

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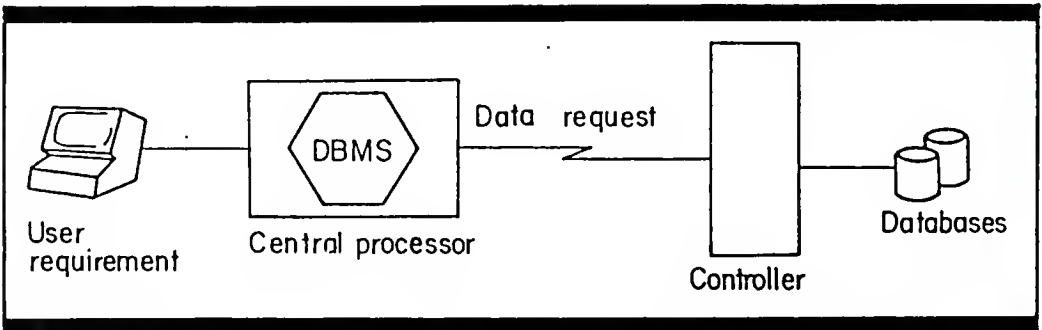


Figure 6. Remote Physical Storage

tween nodes in a nondirected fashion.

Data base facilities may be distributed in four different ways. The first of these is illustrated in Figure 4 (see In Depth/17). A user input device communicates directly with the remote processor, which, in turn, will either singly request data for each transaction or will batch the transactions for request to the central processor, which houses the DBMS. Access validation, security checking and the return of data to the user will be carried out by the DBMS through the communications network and the remote processor, which hands it off to the end user.

Applications can reside in multiple processors within the company (see Figure 5). Each processor needs a directory indicating the location of data types or subjects of interest in other processors as well as its own. A user requirement for data can then be directed through a communications network to the correct processor for handling such a data request. Protocols exist for transferring either a single record or an entire file between DBMS. If the data in one machine at a time is read-only, the protocol procedure is relatively straightforward. If, on the other hand, the data is updated on all machines within the network, the user must be very careful to avoid file, record or even data element lock-outs.

The third method of distributing data involves remote physical storage. Figure 6 shows that we have a

centralized DBMS but have remotely stored the data in order to take care of special security considerations, audits and archival data or to take advantage of mass storage systems. In the latter case, the same physical data may be read by users, but not written by them. Examples of such data bases would include library abstracts, stock market data and econometric data bases. All of these are typified by a company that sells data or data-oriented services to its customers. This type of service is expected to grow significantly during this decade.

A substantial data directory is needed to support the remote processor environment shown in Figure 7. In this case, the user requests a logical record through a remote computer or an intelligent terminal that is too small to house a DBMS. The request goes to a parent DBMS on a distributed data base network. Through the directory, the DBMS then finds the data that was requested and returns it to the end user. Much effort and computing cycles may be wasted if the directory is not kept up to date in a synchronized fashion and distributed to the processors that house DBMS at all locations.

In the four cases shown in figures 4 through 7, while it may be easier to implement data bases in a remote fashion, it is most difficult to control, synchronize and create concurrency among them.

Stratifying Data Bases

To obtain a clearer understanding of the distributed data base environ-

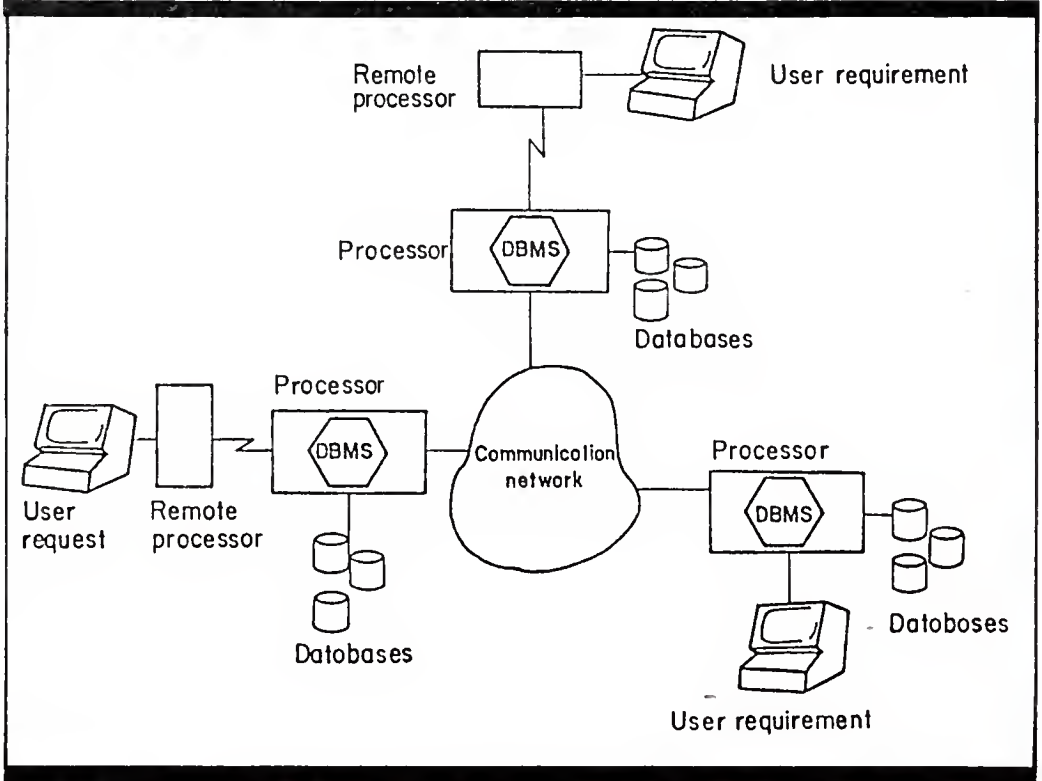


Figure 7. Remote Processor DBMS Network

ment and how users can take advantage of it in the corporate setting, it is helpful to think of a three-level data base (see Figure 8).

Level 1 consists of subject data bases only. This level contains the highest level of data integrity. Data bases at this level must be the most stable and protected. A data base at Level 2 or Level 3 is never allowed to replace a data base in Level 1. This has been tried in many companies and has proven to be one of the surest ways to lose data integrity.

Instead, data bases are synchronized at Level 1 by receiving transactions from Level 2 and Level 3 and then rederiving Level 2 and 3 data bases at some quiet point in processing. When such derivation is necessary, companies always ask, "How do we synchronize data bases at different levels?" If it is economically justifiable, the company can have synchronization on a transaction-by-transaction updating of the Level 1 data bases as well as any Level 2 updates that exist.

Synchronization is often a desire rather than an absolute business necessity. Very few applications require total synchronization among various data base levels. Nevertheless, if the company is willing to pay for it, it is possible.

Of course, for some organizations such as banks, update of customer transaction data bases must be achieved through total synchronization. In fact, banks are required by law to keep track of activities in branches as well as the central office so that cash positions can be audited at all times.

The Level 2 data bases are derived from Level 1. This process often sends the Level 2 data base to a remote site in a different data structure and sometimes to a different DBMS to provide for better performance.

The subject data bases are built in such a way that they support all activities of the company by allowing subjects to be derived for multiple

applications. The Level 2 data bases, on the other hand, are considered more operational in an on-line environment because they are able to combine subjects in order to achieve certain performance objectives. Companies that have attempted on-line processing of data through only a centralized environment of subject data bases have failed miserably. High-volume transaction applications have required the recombination and structuring of subjects in order to achieve the performance necessary within the company.

The Level 2 data bases should be "read only" as much as possible to avoid many lockout and synchronization problems that can come up with multiple levels of updates going on in a computing environment.

When the application insists on updates to a Level 2 type of data base, though, we should batch these applications together and send them to the Level 1 data base for updating. By so doing, we are able to afford the time to run the transactions through various screens and edits in order to ensure data integrity at the subject data base level. The company is able to rederive the Level 2 data base or provide backup and recovery of these data bases if they are harmed. If such backup is needed, one must invoke the last derivation of the Level 2 data base plus the transaction log since the last derivation.

Level 3 is primarily used for research, development and local application endeavors. Data bases at this level must be interfaced with fourth-generation languages so that users can do their own structuring, manipulation and demand reporting from specialized data analyses. The class of user for a Level 3 data base environment would include graphics designers such as engineers, major resource allocators such as operations research professionals, market forecasting personnel and econometric modeling professionals.

Data is managed at all three levels

through data administration and dictionary controls. In these areas, the company must undertake a strategy that identifies criteria for distributed data environments.

Unresolved Problems

From an overall standpoint, the problems with data base distribution are so troublesome that it is wise to limit it. We have already discussed three data base levels and some methods that will help a company to

avoid some of these problems. Each particular implementation should involve close scrutiny to make sure that once available, the three data base levels will perform with the characteristics listed in Figure 9 and can also meet the transaction load required at that level.

The problems are as follows:

1. **Recovery.** Recovery after failure needs to be tightly controlled so that updates are not accidentally lost or double-processed. Backup and re-

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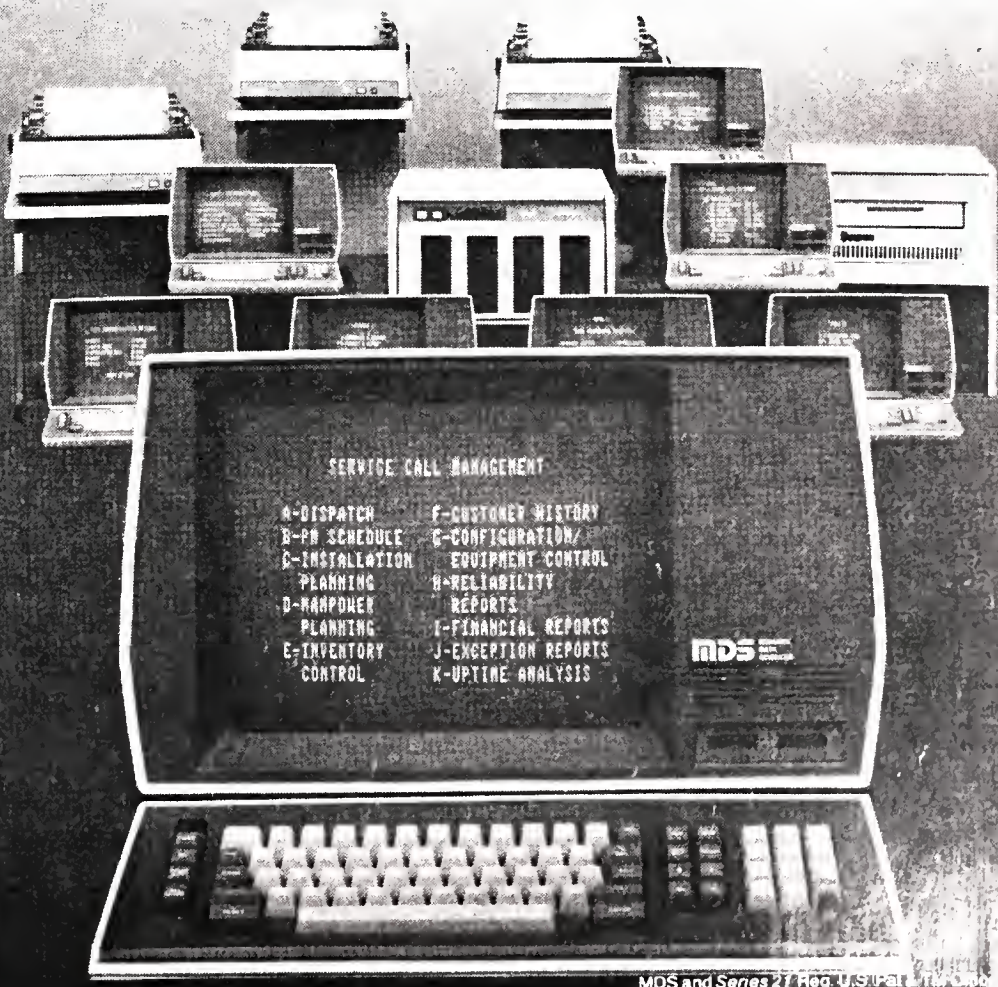
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Characteristic	Stratification level		
	Level 1	Level 2	Level 3
Data orientation	Subject	Combined subjects	Application
Access purpose	Predetermined batch update transactions	Read only or minimal update transactions	Total user control for ad hoc data use and design
Output reports	Predetermined periodic reporting	Exception special demand reporting	Special design reports
DBMS type	Production-oriented DBMS	Limited ad hoc query DBMS	Fourth-generation language DBMS
Transaction feeds from	Level 1 user Level 2 user Level 3 user	Level 2 user	Level 3 user
Database replacement from	Back-up databases only	Level 1 plus transaction lag	Level 2 or level 1 plus transaction log
Distribution tendency	Highly centralized	Distributed by application requirement	Highly decentralized
Data administration and dictionary jurisdiction	Yes	Yes	Yes

Figure 8. Stratified Data Base Characteristics

covery in a distributed data base environment take many times longer for all parties concerned than in a centralized environment.

2. Recovery of multiple copies of distributed data. Because of the synchronization problem with distributed data, we may have multiple copies of the data in different states of update. After a period of failure, they must be resynchronized. The company must invoke the three strata discussed earlier so that the subject data

bases plus the transaction log will allow the company to synchronize Level 2 or Level 3 to the point of recovery initialization.

3. Transactions that update distributed data may interfere with each other. Two or more transactions may be updating the same data file, segment, set or relation on a remote storage device. This may be done in such a way that completed transactions arrive at incorrect data. Consider the following sequence:

Step A: Transaction A reads an account balance of \$100 from record No. 1.

Step B: Transaction B reads an account balance of \$100 from the same record.

Step C: A updates the value since the customer made a deposit of \$500, making it \$100 plus \$500, and writes it into storage.

Step D: B updates the value from yet another deposit transaction of \$300, making it \$100 plus \$300, and

writes it into storage.

The final result should have been \$100 plus \$500 plus \$300. However, Transaction B has overwritten Transaction A's update, making the final answer \$100 plus \$300. To prevent this type of error, most DBMS today perform some type of partial lockout of Transaction B until Transaction A has finished using that part of the data base. Then B is allowed to continue in its update mode.

This seems like a relatively simple solution for this problem, and it is when updates regard a single record. But more complex solutions are required for transactions that cause data to be searched through multiple or distributed data bases before updating takes place. This gives rise to further problems.

4. Distributed data engenders inconsistent reads and use of the data. When more than one copy of data is used, the company stands the chance of generating reports from multiple sources that are unsynchronized. Due to timing problems, data that is read from multiple sources may not always be in agreement. This problem can be prevented with appropriate locks of the DBMS, or synchronization protocols can be implemented.

5. Deadly embrace. When the DBMS locks distributed data bases in order to prevent update interference or inconsistent reads, deadlocks often result. Two or more transactions may attempt to read or update two or more records when both transactions are requesting the same two records. Consider a situation in which Record 1 is read but cannot be updated until Record 2 is read, and Record 1 must be locked during the updating process. The following sequence of events occurs:

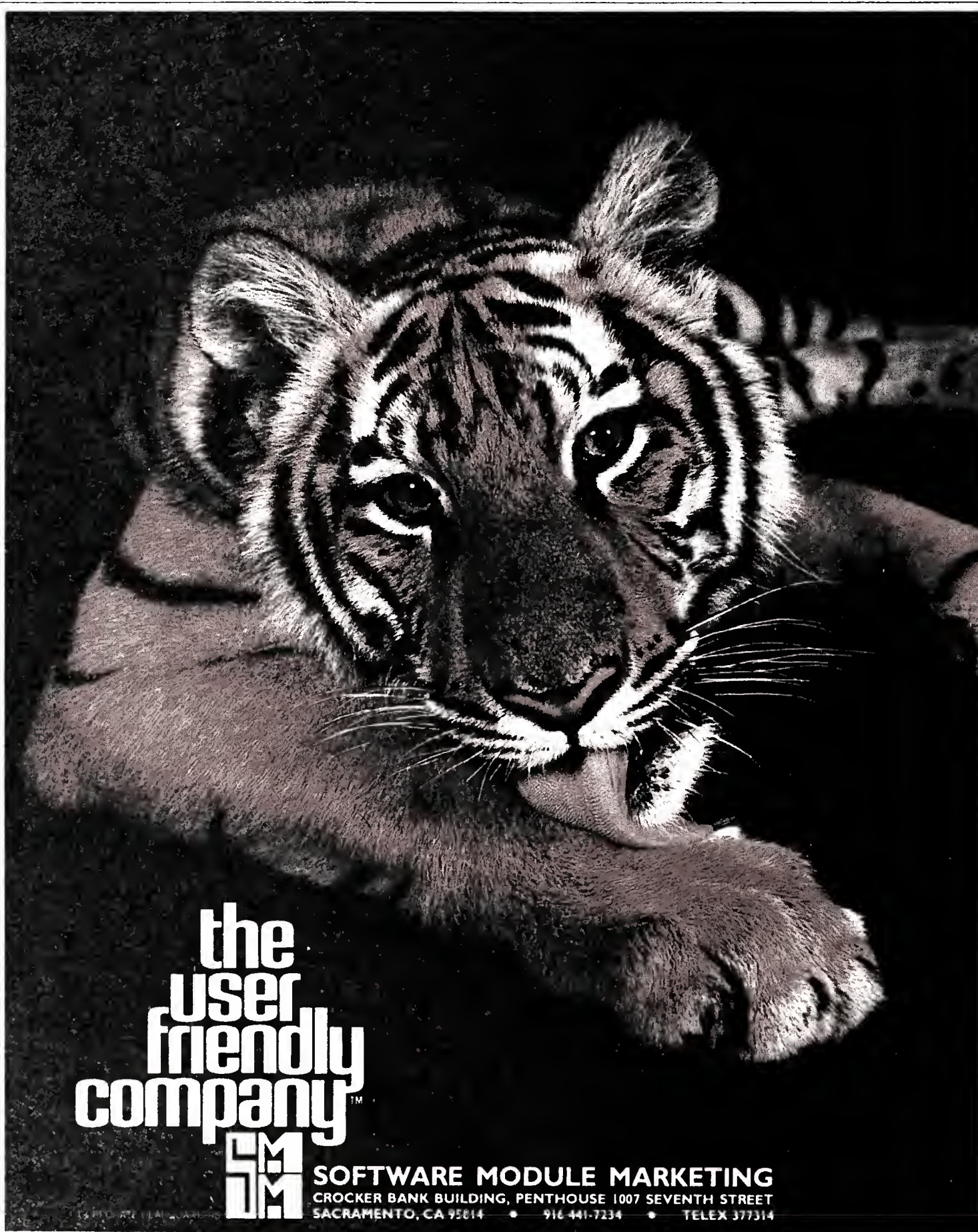
Transaction Y locks Record 1. Transaction Y reads Record 1. Transaction Y reads Record 2. Transaction Y updates Record 1. Transaction Y unlocks Record 1.

A deadly embrace can occur if another transaction locks Record 2 and cannot release it until it has read Record 1.

Thus, Transaction Z handling occurs as follows: Transaction Z locks Record 2. Transaction Z reads Record 2. Transaction Z reads Record 1. Transaction Z updates Record 2. Transaction Z unlocks Record 2.

The deadly embrace will occur as follows: Transaction Y locks Record 1. Transaction Y reads Record 1. Transaction Z locks Record 2. Transaction Z reads Record 2. Transaction Y tries to read Record 2, but it is locked. Transaction Z tries to read Record 1, but it is locked.

Both transactions wait for the records they want to become unlocked, but neither unlocks. Most good DBMS are programmed to back the transactions out of this situation. However, it is still a problem since many compute cycles are lost while the system is backing out the transactions.



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6. Protocol overhead.

The protocols needed to prevent invalid updates, inconsistent reads and deadly embraces can cause excessive overhead within the distributed data base environment. Indeed, they even cause overhead in a centralized data base environment. But when transactions go after data in multiple locations, the problem of deadly embrace can be significantly increased. The way the organization develops and distributes the three strata discussed earlier requires planning and classification of user applications in order to avoid such protocol overhead.

7. Protection of the security, privacy and auditing functions within the company is difficult in a distributed environment. It is most difficult to determine who did what to certain records at various points in time in a distributed environment. Also, security controls and privacy protection are often poor on distributed systems because of the total lack of control over the DBMS.

Until we get a better handle on integrated distributed environments through a controlling directory or integrated dictionary, this problem will continue to plague the distributed data base system. A data security officer within the company should pay special attention to this area.

In Summary

With the advent of optic fibers, digital microwave and tremendous growth in the chip industry, new devices are becoming available every day. Unfortunately, many companies are not attempting to coordinate their equipment into one overall data-handling environment. It is not unusual to see the DP department choosing mainframes, the office man-

agement area selecting word processors and desktop computers and the production area picking its minicomputers and process controllers.

Diversification and isolation of products and services

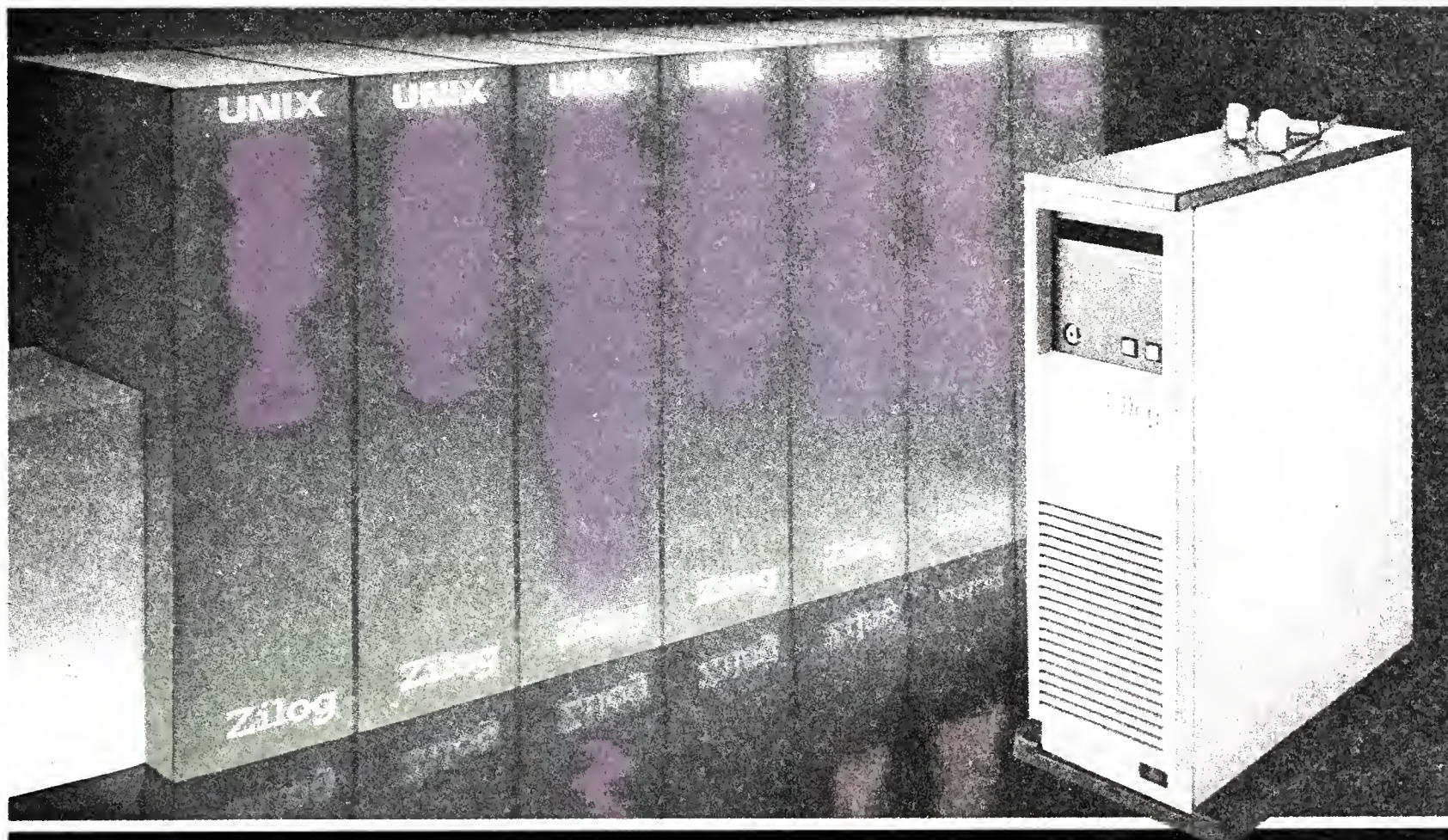
will require more emphasis on distributed data bases. To use technology effectively as it develops, corporations must establish normalized subject data bases as well as an organization for manag-

ing data resources.

The need for data base stability is stronger than ever before. Users need to be sure that a change in a subset of business activities will not wildly affect subject data

base implementations. They will need to add new applications and change old applications as business needs arise without having to restructure, reorganize and reload data bases.

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Robert H. Holland is president and chairman of Holland Systems Corp. in Ann Arbor, Mich. He directs the research, design and development of Holland Systems' family of proprietary software products for automating application designs.

Holland was formerly president of Database Design, Inc., where he developed data base design methodologies, and was one of the architects of its data base design software package known as Data Designer.

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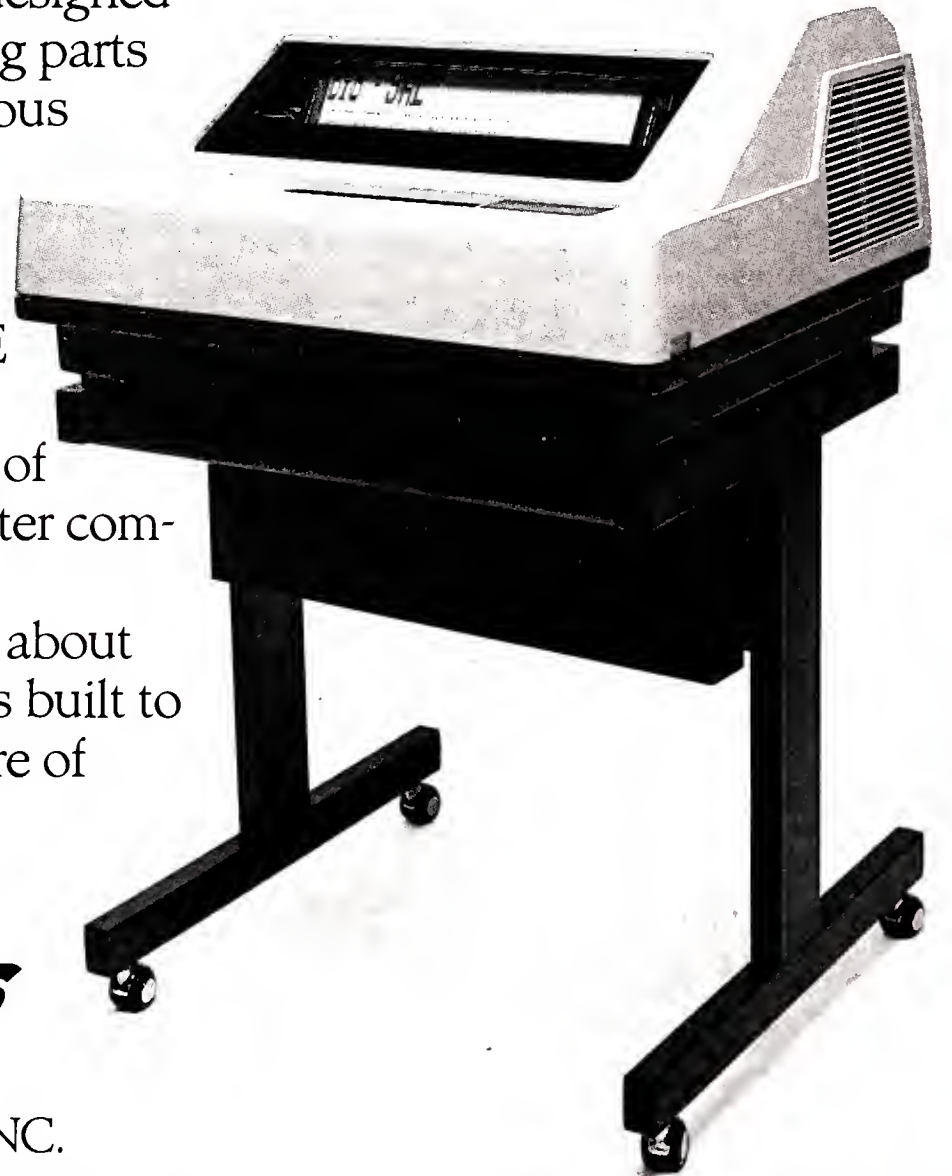
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Also Doubles Its Disk Capacity

DG Upgrades I/O of Eclipse S/20 Mini

WESTBORO, Mass. — Data General Corp. beefed up the I/O capacity of its Eclipse S/20 minicomputer last week with a high-speed, board-level enhancement said to offer a thirteenfold improvement in I/O speed.

DG also doubled the disk capacity for the S/20 by adding a 50M-byte Winchester disk subsystem. In a third announcement,

the company reported that it has packaged four configurations of the S/20 that incorporate the 50M-byte drive. The firm also announced three 15M-byte disk subsystems for the S/20.

The enhancements, DG said, are aimed at making the S/20 more attractive for computer-aided manufacturing applications.

The I/O enhancement board, called the Microburst Multiplexer Channel (MicroBMC), provides a standard high-speed I/O interface between high-speed custom devices, such as those which transfer large blocks of data directly to memory, and the S/20 processor.

The MicroBMC increases S/20 I/O throughput from 300K byte/sec to 4M byte/sec. The MicroBMC costs \$1,100 and can be installed on any S/20 system, DG said.

The 50M-byte Winchester drive, when used with the MicroBMC, increases the data transfer rate on the S/20 to 881K byte/sec. The drive costs \$10,500 and can be used on all S/20 systems with the MicroBMC, the vendor said.

Three 15M-byte disk drives were also announced for the S/20. A nonremovable disk drive with the MicroBMC interface costs \$6,200. A 15M-byte drive with the MicroBMC and integral cartridge tape unit costs \$10,500. The same unit with an integral diskette unit costs \$8,900, DG said.

(Continued on Page 70)

Model CTi 3000 Control Unit Equipped With Multiuser Micro

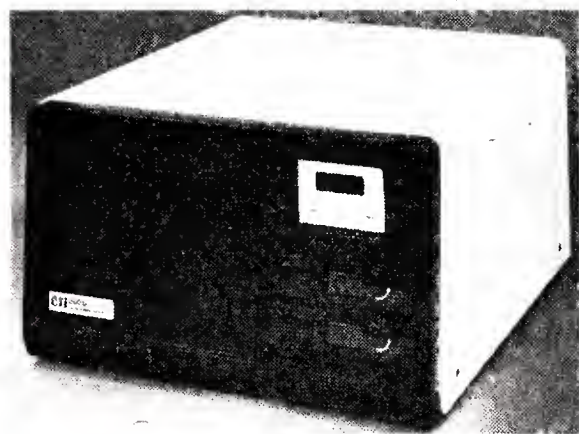
RALEIGH, N.C. — CTi Data Corp. has introduced an IBM 3270-compatible terminal control unit equipped with an integral, multiuser personal computer.

By utilizing the Model CTi 3000, 3270 users reportedly can realize the benefits of

a local, multiuser personal computer without investing in new host software and additional communications lines or workstations. Tasks now performed in many locations by single-station personal computers can be combined into one shared resource unit, the vendor claimed.

The control unit also provides a wide range of software compatibility — Digital Research, Inc.'s CP/M 86 and MP/M 86

(Continued on Page 70)



Model CTi 3000 Control Unit

Osborne Announces Portable With 7-In., 80-Char. Screen

HAYWARD, Calif. — Osborne Computer Corp. has unveiled a second portable computer that reportedly addresses many of the shortcomings and criticisms lodged against the firm's first machine, the Osborne 1.

The Executive features a 7-in. CRT screen as opposed to the 5-in. screen offered with the first model. This allows for an 80-char. rather than a 52-char. display.

The machine also reportedly emulates IBM 3270, 3780, 2780 and 3741 terminals as well as the X.25 communications protocol.

Additional features reportedly include:

- An applications package that permits emulation of other terminals such as those from Beehive International and Televideo, Inc.
- A separate RS-232C port, commonly used to connect a modem to the portable computer.

The Executive resembles the Osborne 1 and weighs 25 lbs, one pound heavier than the previous version.

To accommodate the system's larger screen, Osborne reportedly replaced the standard dual-diskette floppy disk drives with "slim-line" drives that are half the height of the previous units' drives and boast roughly the same storage capacity.

The firm also reportedly rearranged some of the original Osborne controls to improve accessibility.

For instance, the power switch is located under the right-hand disk drive, and located beside it is an RS 470-composite video port to accommodate an external monitor.

Like the Osborne 1, the Executive is built around Zilog, Inc.'s Z80 microprocessor. However, main memory has been increased to 128K bytes of random-access memory, according to Osborne. The system also operates with the latest version of Digital Research, Inc.'s CP/M, CP/M Plus Version 3.0.

Finally, Osborne reportedly improved the system's documentation.

The Executive's instruction manual is presented in five modules: a beginner's guide, executive user's guide; an explanation of CP/M and the P operating systems; an executive tools section; and a reference section summarizing all of the system's commands.

The Osborne Executive costs \$2,495, \$500 more than the Osborne 1. Additional information can be obtained from the firm at 26500 Corporate Ave., Hayward, Calif. 94545.

Apple Drops Price, To Halt Model

CUPERTINO, Calif. — Apple Computer, Inc. has dropped the price on the 256K-byte version of its Apple III by \$800 and will stop producing the 128K-byte model of the system because of demand for the larger memory machine.

The company has reduced the suggested retail price of the 256K-byte version to \$2,695 from \$3,495. The price of the 128K-byte version has also been cut to \$2,495 from \$2,995.

Apple said that by stopping production of the smaller memory system, it will be able to standardize its production methods, making cost reductions and production efficiencies possible.

More information can be obtained from the vendor at 20525 Mariani Ave., Cupertino, Calif. 95014.

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SYSTEMS & PERIPHERALS

Fault-Tolerant Banking System 68000-Based

ENGLEWOOD CLIFFS, N.J. — Auragen Systems Corp. has unveiled what is reportedly the first fault-tolerant computer based around multiple Motorola, Inc. 68000 processors.

Aimed at applications involving automatic banking, funds transfer and insurance claims adjustment, the Auragen 4000 system uses between three and seven 68000 chips grouped into tightly coupled clusters. Several clusters can be loosely coupled by two 16M bit/sec buses that can be expanded up to 32 clusters, the company said.

Each cluster consists of a 68000-based executive processor; a dual 68010-based work processor; up to four 68000-based communications processors; up to four disk/tape pro-

cessors and eight 1M-byte memory boards.

The system runs under Auros, Auragen's version of Bell Laboratories' Unix III operating system. According to the vendor, the system has been enhanced with a full relational data base management system (DBMS), Ansi 74, Cobol, Pascal, Fortran 77, Basic and C languages and communications software. It also supports such productivity tools as a menu manager, screen manager and a transaction management system.

Communications protocols supported by the system include synchronous, asynchronous and Synchronous Data Link Control. The system is also compatible with the X.25, Systems Network Architecture

networks, as well as with the company's own local-area network.

Auragen officials claimed that the system's fault-tolerant operation is automatic and transparent to the user, requiring no special programming. This capability is reportedly achieved by partitioning the system so that operating system functions and fault-tolerant operations are kept separate from the applications programs, a spokesman explained.

In a configuration that includes four 156M-byte disk drives, a 2M-byte memory cluster, one streaming tape, one 600 line/min line printer, 30 intelligent terminals and the Auros operating system, the Aurogen is capable of executing 3.4 million instructions per second.

The Aurogen is priced at \$398,000. More information about the 16/32 system can be obtained from the vendor at 210 Sylvan Ave., Englewood Cliffs, N.J. 07632.

Monitors Offer Micro Graphics

TORRANCE, Calif. — Two display monitors said to offer professional-level graphics images are available from Comrex International, Inc.

The Model CR-5400 is a 9-in. monitor with a resolution of 800 line/in. and is designed for portable computer applications. The Model CR-5600 is a 12-in. monitor with 1,000-line/in. resolution and is suited for desktop applications, a spokesman for the vendor said.

Both offer a choice of three image colors — green, yellow-green and amber — on an antiglare screen. The pair is said to be compatible with "virtually all computers produced for the personal computer market," according to a spokesman.

The CR-5400 is priced under \$200 and the CR-5600 under \$230 from the vendor at 3701 Skypark Drive, Torrance, Calif. 90505.

CAD/CAM Net Compatible With IBM CPUs

ACTON, Mass. — CGX Corp. has announced the Graphics Display System 2001, a graphics display computer-aided design/computer-aided manufacturing (CAD/CAM) workstation network that is compatible with IBM mainframes.

The 2001 allows users to mix independent color raster and monochrome vector terminals on a single network. The CGX 2010 channel unit can run any combination of up to 16 color and monochrome CAD/CAM workstations on a single coaxial cable up to two miles long, the vendor said.

The CGX 2020 vector display station and the 2030 color raster display station emulate IBM's 3250 graphics display terminal and were designed to provide interactive response speeds required by various vendors' IBM-compatible graphics software packages, the vendor said.

With appropriate graphics software, the 2001 can perform a variety of CAD/CAM applications, including mechanical design and drafting of aircraft and aerospace vehicles, passenger cars and trucks, farm equipment, industrial machinery, tools and dies, printed circuit board layout, electrical schematics and structural designs for architects, the vendor said.

The 2001 can be used with IBM 360, 370, 30 series and 4300 series mainframes.

The system costs \$299,000 for a 2001 system with four 2020 vector display stations, four 2030 color raster display stations and a 2010 channel unit, the vendor said. The vendor is located at 42 Nagog Park, Acton, Mass. 01720.



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Ultimate Announces Mini With 128K-Byte Memory

CLARK, N.J. — The Ultimate Corp. has announced a minicomputer system with a configuration of 128K bytes of memory, 15M-byte disks, a ¼-in. cartridge tape drive, one CRT and a serial printer.

Workstation Bows for CAD

ENGLEWOOD, Colo. — Sigma Design, Inc. has unveiled a computer-aided design (CAD) workstation configured around the Motorola, Inc. 68000 microprocessor.

The Sigma III is intended for architectural design, engineering and construction applications, according to the vendor. It incorporates the vendor's Sigmagraphics II three-dimensional software system and added capabilities, including windowing, dynamic drag and on-screen hierarchical menus for novice users.

The system is priced at under \$100,000 with additional workstations available for approximately \$50,000.

Further details are available from Sigma Design at 7306 S. Alton Way, Englewood, Colo. 80112.

System/34, 38 Get Line Printers

TUSTIN, Calif. — General Business Technology, Inc. has announced a line of high-speed line printers for IBM's System/34 and System/38 processors.

Called the 3200LP series, the printers are available with print speeds of 360, 720, 1,130 and 1,440 line/min. All models feature a swing-open gate for paper loading, interchangeable print bands and a towel ribbon rated for two million lines of print, the vendor said.

The printers are priced between \$13,600 and \$25,000, the vendor said from 2630 Walnut Ave., Tustin, Calif. 92680.

Micro Five Out With Price Cuts

IRVINE, Calif. — Micro Five Corp. has announced a series of price reductions ranging from 16% to 28% on its Series 3000 multiuser computer systems.

The decreases in list price affect five basic models of the Series 3000 that provide a variety of combinations of main memory and disk capacity, the vendor explained. For example, the Model 3311, which includes a Series 3000 CPU with 128K bytes of main memory, a 34M-byte hard disk, a 1.2M-byte floppy disk drive, a 13M-byte magnetic tape drive, five RS-232 I/O ports and the operating system of the user's choice, has been reduced 21%, from \$23,335 to \$18,495.

Further details are available from Micro Five headquarters, which is located at 17791 Sky Park Circle, Irvine, Calif. 92714.

The Model 750 can be upgraded to a seven-user system with 256K bytes of memory and 60M-byte disks. It is architecturally identical to the company's other Digital Equipment Corp.-based products and is serviced by Honeywell, Inc.

The system incorporates a proprietary bus design developed by DEC, which connects the central processor to all memory and peripheral devices. All boot, monitor and I/O functions required for systems operation are performed by a standard DEC LSI-11/12 processor board.

The Model 750 is priced at \$22,000 from Ultimate, 77 Brant Ave., Clark, N.J. 07066.

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HP Unveils Color CAD Unit Based on 68000

PALO ALTO, Calif. — Hewlett-Packard Co. has announced a color stand-alone computer-aided design (CAD) workstation based on the Motorola, Inc. 68000 microprocessor.

Called the HP Series 200 Model 36C, the unit offers four graphics memory planes, gray scale and a color map which can be accessed through HP's Basic or Pascal graphics language extensions, HP said.

The Model 36C can produce colors in two ways. Selection of 16 true colors from a palette of 4,096 colors can be made by controlling the intensity of CRT guns. The 36C can also generate 4,913 dithered area shades for color compatibility with HP products.

The Model 36C also features four memory planes offering four bit/

pixel, HP said.

The unit incorporates up to 2M bytes of read/write memory, which is expandable to 7.4M bytes with an optional external expander. Through the HP Shared Resource Management Network, the Model 36C can be

linked to other Series 200 processors or the firm's 32-bit HP 9000 family of processors, HP said.

The Model 36C costs \$15,140 including the 68000 microprocessor, a built-in HP-IB port, dual 5¼-in. flexible disk drives with 264K bytes of

formatted storage space each, a color display with four graphics memory planes, keyboard and 128K bytes of memory. More information is available through the Inquiries Manager, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Z80-Based Single-Board Computer Out

INDIANAPOLIS — Micro-Link Corp. has introduced a Zilog, Inc. Z80-based single-board computer. The STD-147 is said to eliminate the need for separate memory, I/O and time functions, while maintaining standard bus compatibility, at the price of a conventional standard bus CPU card.

The on-board, 64K-byte dynamic random-access memory (RAM) may be reconditioned for use with off-card memory-mapped boards. Its 28-pin byte-wide socket also permits the use of up to 16K erasable programmable read-only memory for use with on-board monitors or booting of programmable read-only memo-

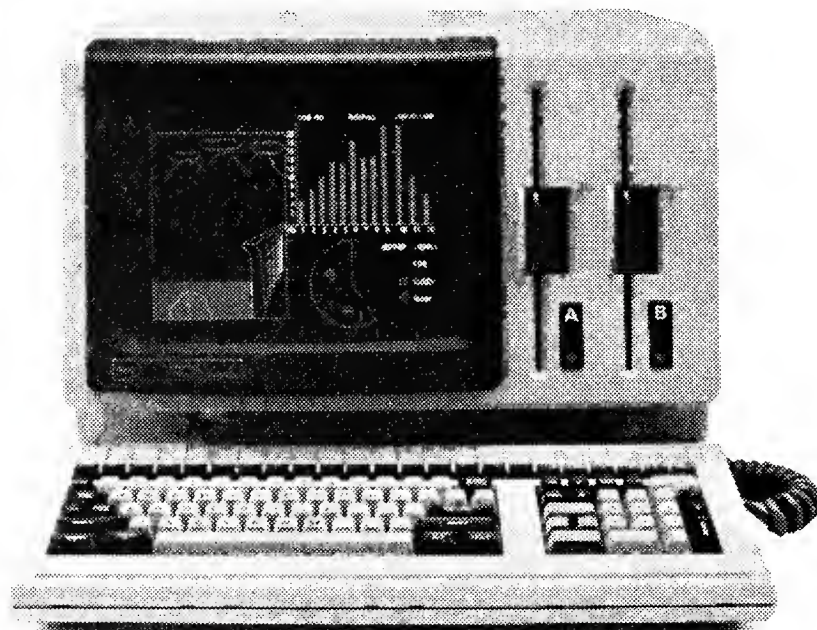
ries in the "phantom" configuration.

Features include an on-board serial port, complete with programmable bit/sec rate generators, eight programmable lines, read-only memory or RAM disable and 3.69 MHz A80A with crystal clock.

Single-unit price for the STD-147-001 is \$250. The STD-147-101, with 64K-byte RAM, is \$395. Micro-Link is located at 14602 N. U.S. Highway 31, Carmel, Ind. 46032.

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Control Unit Fits IBM 3270

(Continued from Page 67)

and Microsoft Corp.'s MS-DOS — and workstation connectability.

It is a multiple processor-based system utilizing the 16-bit Intel Corp. 8086 microprocessor. The operating system, developed by CTi Data, includes functions necessary to control host communications, memory, storage devices and I/O devices.

The base unit, supplied with a single processor and 128K bytes of memory, is capable of supporting information to four or eight workstations, depending on workstation type. The CTi 3000/1 may be expanded to support up to eight or 16 devices, depending on device type, and offers up to 756K bytes of memory and 10M bytes of disk storage.

CTi 3000 reportedly provides multiuser remote processing capability through the incorporation of one or more CTi-designed dedicated processors into the unit. Also, the CTi 3000/1 has two communications ports, one compatible with IBM 3270 bisynchronous or Systems Network Architecture/Synchronous Data Link Control line protocol, the other for dial-in diagnostic testing.

Prices begin at \$5,990 for IBM 3274 compatibility without processing quality; with local processing, prices begin at \$7,500. CTi Data is located at 5275 North Blvd., Raleigh, N.C. 27604.

DG Ups I/O Of Eclipse S/20

(Continued from Page 67)

An S/20 with the MP/AOS operating system, the 50M-byte disk drive and cartridge tape unit costs \$27,800. The same configuration with a streaming tape drive instead of the cartridge tape unit costs \$30,150.

An S/20 with the Rdos operating system, the 50M-byte disk drive and a cartridge tape unit costs \$27,000. The same configuration with a streaming tape drive costs \$29,350, DG said from 4400 Computer Drive, Westboro, Mass. 01580.

RLPS Gets Enhancements

STAMFORD, Conn. — Digital Associates Corp. has enhanced the functionality of and added applications to its Remote Line Printer System (RLPS).

Enhancements include improved data compression, expanded buffers for higher throughput, built-in diagnostics and an alphanumeric status display. Other enhancements include an autodialer that stores and recalls up to 50 remote-site phone numbers, satellite circuit compatibility and support for integral short-haul modems, according to a vendor spokesman.

RLPS connects to a parallel printer port and was designed to boost throughput and data integrity. The

unit can be used with a variety of computer systems and printers.

RLPS alone costs \$5,950. The vendor also offers the unit configured with a variety of vendors' printers. More information is available from Digital Associates, which is located at 1039 E. Main St., Stamford, Conn. 06902.

Systemathica Unit Based on IAPX

PITTSBURGH, Pa. — Systemathica Consulting Group Ltd. has announced a modular, dual-bus, single-board computer.

The DBC-1880, based on the Intel Corp. IAPX 188 microprocessor, is said to allow the use of IBM Personal Computer-compatible subsystems on the Intel Multibus and to establish a

Z80-Based

Nohalt Micro System Out

FARMINGDALE, N.Y. — Nohalt Computers, Inc. has announced the NH-1000, a redundant microcomputer system based on the Zilog, Inc. Z80 microprocessor.

The NH-1000 uses a dual data bus design connecting duplicated system

control processors and disk drives. Dual power supplies are included with the system and up to 100M bytes of memory can be stored on each disk drive, the vendor said.

The NH-1000 can support up to 16 slave processors, each with its own math processor. Up to four workstations can be connected to each slave processor. The NH-1000 operating system is compatible with Digital Research, Inc.'s CP/M and MP/M operating systems, the vendor said.

The NH-1000 is offered through systems houses and microcomputer dealers. A base system costs about \$25,000. More information is available from the vendor at 1750 New Highway, Farmingdale, N.Y. 11735.

Zenith Extends Z-100 Line

GLENVIEW, Ill. — Zenith Data Systems Corp. has extended its Z-100 line of desktop computers with the introduction of two models featuring built-in, 5-in. 11M-byte formatted Winchester hard disk drives.

The Winchester drive increases the Z-100 storage capacity more than 17 times to 11M bytes, giving it the ability to hold all the accounting functions of a business, the vendor suggested. The additional models are reportedly being made available in both a low-profile (ZW-110) and an all-in-one (ZW-120) version with built-in video display.

The products will sell for \$5,499 and \$5,599, respectively, according to a vendor spokesman. Further details are available from Zenith at 1000 Milwaukee Ave., Glenview, Ill. 60025.

Pulizzi Unveils Power Controller

SANTA ANA, Calif. — A power controller for protection against spikes, noise and surges has been introduced by Pulizzi Engineering, Inc.

The Z-Line LPC115-4 Power Controller reportedly delivers filtered protection of both electromotive interference and radio frequency interference, both line-to-line and line-to-ground.

The unit also provides transient voltage spike protection at 130 Vac and root mean square clamping with a transient peak current to 6,000A, according to a spokesman for Pulizzi Engineering.

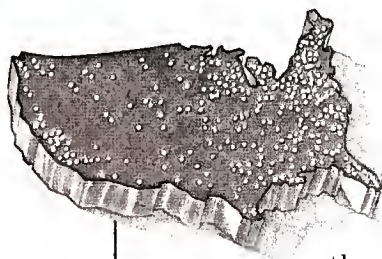
Rated at 12A and 1,500W, the controller costs \$149.95 from 3260 S. Susan St., Santa Ana, Calif. 92704.

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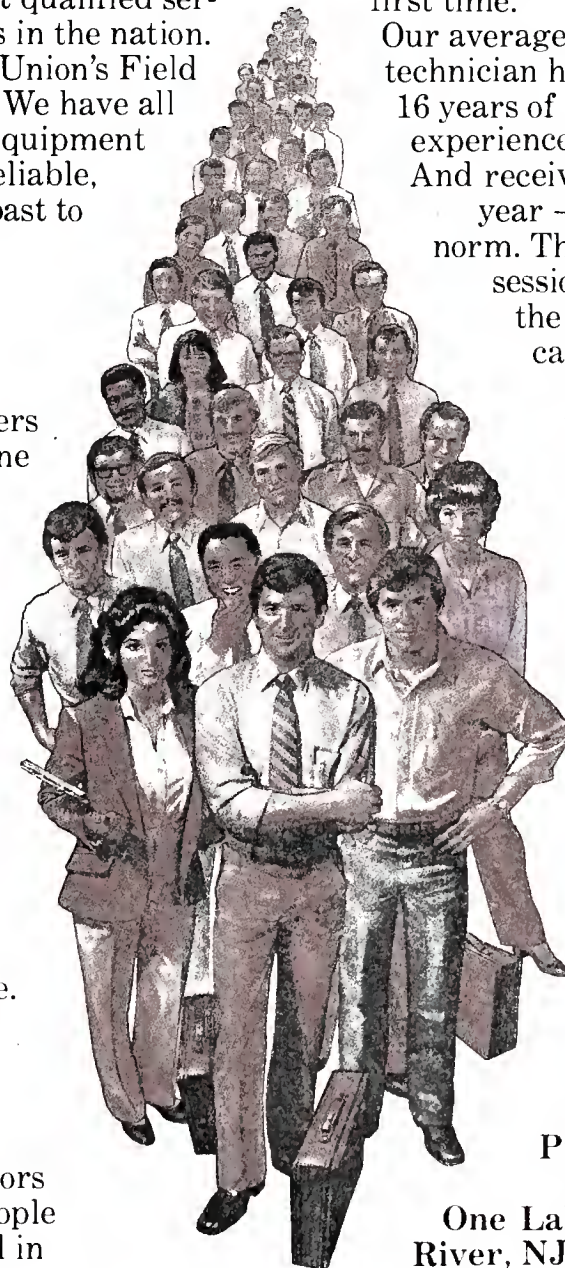
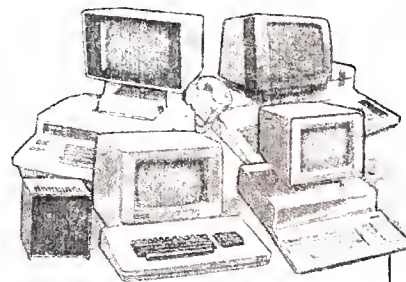
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Stand-Alone Security Device Out

PHILADELPHIA — IMM Corp. has announced the Computer Sentry, a stand-alone security device designed to protect computer systems against unautho-

Module For Speech Announced

HARTFORD, Conn. — General Digital Corp. has announced the addition of a speech synthesizer expansion module to its line of GDx modules compatible with Intel Corp.'s single-board computer and National Semiconductor Corp.'s board-level computer board expansion sockets.

The GDx-Speech-TI uses the Texas Instruments, Inc. 5220 processor and employs linear predictive coding 10 techniques. The module reportedly permits the generation of speech from on-board read-only memory vocabularies or unlimited vocabulary capability via CPU-provided data.

Included with the module is an on-board, low-pass filter, 2-W audio amplifier and volume control.

The module costs \$285 from 700 Burnside Ave., E. Hartford, Conn. 06108.

Bar Code Reader Introduced

ELBRIDGE, N.Y. — Skan-A-Matic Corp. has announced the D2 series mini bar code reader.

The unit allows users to read coded data with a hand-held pen or fixed beam scanner. The D2 can accommodate a variety of bar codes and is equipped with two RS-232 ports. Scan speeds of 2 to 60 in./sec are possible, the vendor said.

D2 bar code readers cost from \$730, the vendor said from P.O. Box S, Elbridge, N.Y. 13060.

alized entry via telephone lines.

The unit allows access to a computer system only if the correct digital code is entered. All calls are intercepted by a synthesized voice that asks the caller to enter a code number. An authorized caller can enter the six-digit code either verbally or through a Touch-Tone telephone, the vendor said.

The device is reportedly compatible with any soft-

ware or computer system and does not require programming. For high-security applications, the Computer Sentry can be instructed to shut down the line if a caller is attempting an unauthorized access. For less sensitive applications, the device has an alarm mode, the vendor said.

The Computer Sentry costs \$695, the vendor said from 100 N. 20th St., Philadelphia, Pa. 19103.

Two Options Out For Micro Five Series 1000

IRVINE, Calif. — Two options said to double the hard disk capacities and provide streaming tape backup capabilities for its Series 1000 line of computers have recently been announced by Micro Five Corp.

The .25-in. streaming cartridge tape drive provides the capacity to back up 20M bytes of data in a single tape cartridge, the firm said. It

costs \$4,995, including cabinet and connector cabling.

The hard disk option is said to add another 19M bytes of data storage capacity to the Series 1000, whose maximum internal storage capacity is also 19M bytes.

The disk option plus the streaming tape drive, both in the same cabinet, cost \$7,495 from 17791 Sky Park Circle, Irvine, Calif. 92714.

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Power Loads Up for Whisperpac

LOS ANGELES — Computer Power Products, Inc. has announced increased load capability for its Whisperpac computer power conditioner, designed to remove voltage spikes, brownouts and other sources of "dirty power" to a main-frame computer system.

The Whisperpac is now available for power loads up to 250 kVA and provides 100% load isolation from the utility power line, precise 1%

voltage regulation supplied to the load and ride-through capability to bridge momentary power outages, the vendor spokesman said.

The unit was designed as a synchronous electric motor generator, featuring full digital instrumentation, desktop work space, low-noise fans and a mean-time-between-failure rate of 100,000 hours.

The price of the power conditioner starts at \$20,000, the vendor said.

More information is available from Computer Power Products at 227 E. Compton Blvd., Gardena, Calif. 90248.

Disk Drive Targets Apple

SUNNYVALE, Calif. — Multitech Electronics, Inc. has announced a low-profile, 5¼-in. floppy disk drive for users of Apple Computer, Inc. Apple II microcomputers.

The unit is compatible

Controller Out for VAX-11s

IRVINE, Calif. — Able Computer, Inc. has announced the VMZ/LP printer controller for users of Digital Equipment Corp.

VAX-11 series processors.

The VMZ/LP is compatible with the VAX-11 VMX operating system and contains a single parallel channel programmed to emulate the line printer function on a DEC DMF/32 controller. The unit is also equipped with a 256-char. buffer that may be enabled or disabled by a switch, the vendor said.

The VMZ/LP costs \$1,500, the vendor said from 1732 Reynolds Ave., Irvine, Calif. 92714.

with Apple's DOS 3.3 operating system and was designed for use with workstations or in applications where space is limited.

The disk drive costs \$299 from 195 W. El Camino Real, Sunnyvale, Calif. 94086.

Our new WY300 color terminal gives you great color for less than \$1000.

Manual Out On Security

PENNSAUKEN, N.J. — Auerbach Publishers, Inc. has announced a review of data security liabilities called "Practices and Methodologies: Data Processing Security and Control; An Analysis Design and Evaluations Guide."

The manual provides information on how to identify assets open to risk, determine which assets have security priority, match potential safeguards to potential risks and select safeguards based on cost-effectiveness.

Auerbach has also announced a fifth volume of its computers in manufacturing series, titled "Distribution Management," and a "Telephone Cost and Call Management and Telephone Equipment Selection Guide."

The volume on distribution management costs \$175; the telephone equipment selection guide is priced at \$180. The practices and methodologies manual costs \$125 for subscribers to the data security management information service and \$225 to nonsubscribers. More information is available from 6560 N. Park Drive, Pennsauken, N.J. 08109.

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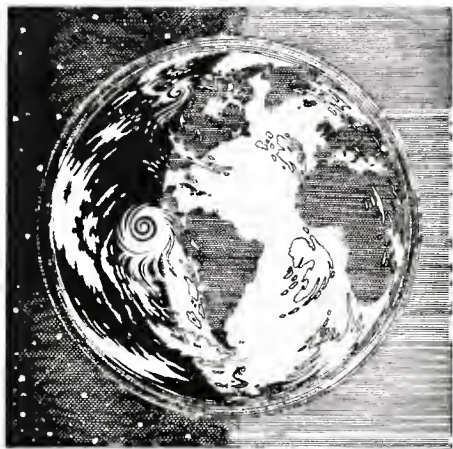
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(10:59 A.M.)



(11:00 A.M.)

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At 11 A.M., we introduced the most powerful 32-bit virtual supermini ever produced by a computer company. Our ECLIPSE™ MV/10000.

Yet our ECLIPSE MV/10000 is simply the latest of a series of steps we have taken over the last year to make choosing Data General the best business decision you can make.

So now, if you do a comprehensive evaluation of your options – you may be surprised at the results.

RANGE. With ECLIPSE MV/10000, we now have the broadest range of computer capability in the business. Which means there's a Data General computer that meets your exact needs. Whatever level of performance you need.

PRICE. When you compare any Data General computer with its competition, you will find one of two things. It will either have a similar price and a lot more performance, or it will have similar performance and a lot lower price. Because that's the way we've always made Data General computers.

COMPATIBILITY. Unlike our competition, we've gone out of our way to keep our entire line of computers compatible. Which has kept a very important option open for you. In the event your needs ever happen to change, you can take your entire investment in software and peripherals onto larger (or smaller) Data General computers.

APPLICATION SOFTWARE. Over this last year, we have signed agreements with major suppliers of software for mechanical, electrical and architectural engineering; medical, process control; financial and decision support applications. Additionally, the MV/10000 forms the base of a powerful integrated office automation system.

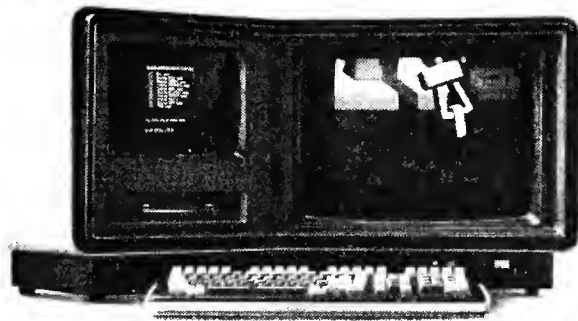
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In the past, you may not have fully considered Data General. But as of March 2nd, it will be in your own best interest to look at us very carefully.

For additional information, contact Business Group M.S.F.134;
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Dot Matrix Printer Series Gets Price Reductions

SALT LAKE CITY, Utah — Micro Peripherals, Inc. has reduced prices on its 80-col., 100 char./sec dot matrix printer line from \$695 to \$599.

Printmate 99 has graphics and multifont capabilities, and both friction and tractor feed are standard, the vendor said. The unit is also equipped with standard parallel and serial interfaces.

Micro Peripherals, Inc. is located at 4426 S. Century Drive, Salt Lake City, Utah 84107.

Power Supplies Feature Multiple Power Ratings

CHATSWORTH, Calif. — Sierra-Cin/Power Systems, Inc. has announced the 5G series of single- and multiple-output switching power supplies.

The units are available in various power ratings ranging from 5V at 65A to 24V at 15A. The power supplies feature a half-bridge design that offers low output noise and good transient response, the vendor said.

The units cost from \$349, the vendor said from 20500 Plummer St., Chatsworth, Calif. 91311.

Sound Reduction Device Designed for Small Printers

CITY OF INDUSTRY, Calif. — Van San Corp. has announced the Model 721 Quietizer, a sound reduction device for small printers.

The unit is designed for printers typically used on microcomputers. It costs \$195, according to the vendor.

Bits & Pieces

The vendor is located at 16735 E. Johnson Drive, City of Industry, Calif. 91745.

Power Conditioners Line Targeted at Mini Market

GARDENA, Calif. — Computer Power Products, Inc. (CPP) has introduced an expanded line of rotary computer power conditioners in the range of 2.5 VA to 12 KVA.

The Mini-CPC is intended for the minicomputer market and reportedly provides 100% isolation from all utility power quality problems including voltage sags, surges, spikes, transients, transverse and common mode noise, harmonic distortion, grid switching, flickers and momentary interruptions.

Prices start at \$4,760, the vendor said from 227 E. Compton Blvd., Gardena, Calif. 90248.

Corona Personal Hard Disk Gets RAM Disk Capability

CHATSWORTH, Calif. — Corona Data Systems, Inc. has announced random-access memory (RAM) disk capability for its Personal Hard Disk for use with IBM's Personal Computer and the Corona personal computer.

The RAM disk enhancement reportedly allows users of the Corona Hard Disk to rely on system memory instead of the disk drive for storing software or data while running programs. Pricing on the Personal Hard Disk starts at \$1,795, the vendor said from Suite 110, 21324 Via Colinas, Chatsworth, Calif. 91361.

Voltage Surge Suppressor, Noise Filtering Device Bow

BETHLEHEM, Pa. — Kalglo Electronics Co. has introduced a voltage surge suppressor and noise filtering device for computer equipment.

The Deluxe Power Console Plus (DPC-Plus) reportedly provides eight individually switched 120V, 15A outlets divided into two banks of four outlets each, a main on/off switch, fuse, status lights and 7-ft grounded, heavy-duty cord set.

The DPC-Plus costs \$94.95 from the firm's Department DPC-Plus, 6584 Ruch Road, E. Allen Township, Bethlehem, Pa. 18017.

Clock/Calendar Plug-In Card Fits Apple II, Apple II+ Units

SAN CLEMENTE, Calif. — Innovative Measurements, Inc. has announced a clock/calendar plug-in card for the Apple Computer, Inc. Apple II or Apple II+ microcomputer, with applications ranging from date stamping data base files to measuring elapsed time in running programs to a resolution of 1 msec.

The IMI Realclock features four modes of interrupt operation. Interrupt periods may be set from 1 msec to 1 year in 1-msec increments. An interrupt output is also provided by the clock when the host Apple is powered down, a vendor spokesman said.

Included with the Realclock is a demonstration diskette that shows methods of reading and writing to the Realclock, along with a demonstration of using interrupts to create a time/date display on the screen while running other programs.

The clock lists for \$190 plus \$5 shipping from Innovative Measurements, Inc., which can be reached through Box 3879, San Clemente, Calif. 92672.

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The ECS 4500 terminal can stand alone as a data processor, or interact smoothly within a distributed systems environment. It's compatible with major mainframe protocols — Burroughs, Honeywell, IBM, NCR, DEC. Using two double-density floppies, it can deliver a hefty 2-MB memory, allowing you to enter and retrieve data — or transfer whole files — to or from different host computers while handling the bulk of your processing needs.

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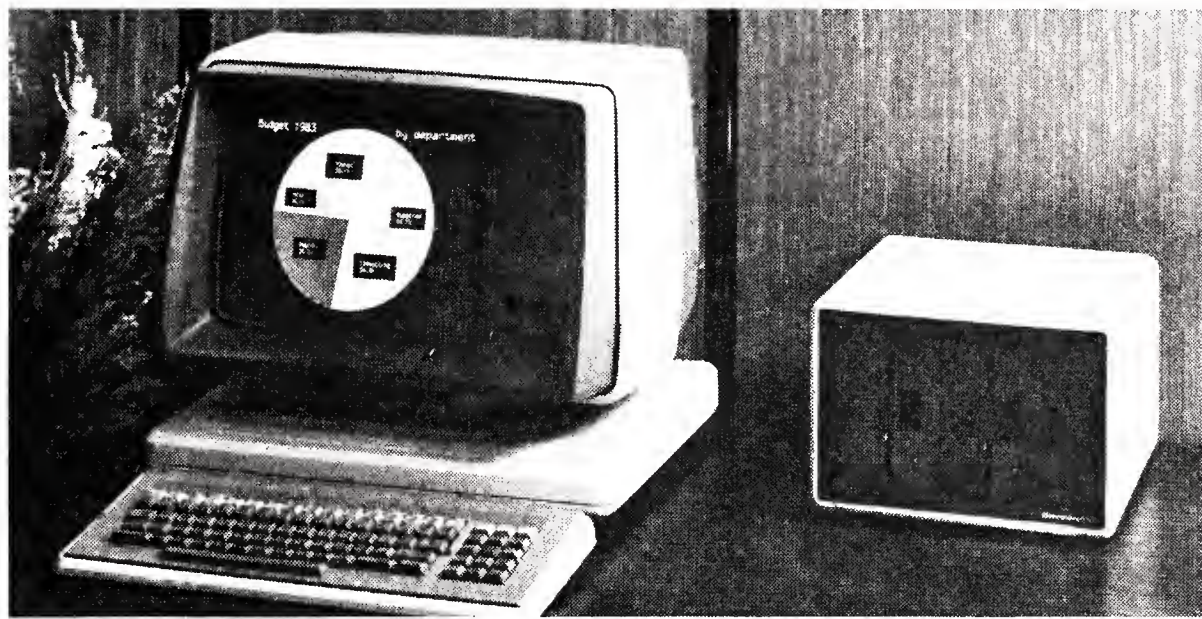
DETROIT — Burroughs Corp. has edged its way a bit further into the office with the introduction of two electronic workstations featuring electronic mail, word processing and other functions when connected to any Burroughs main-frame.

The ET1100 is a general purpose input and display system compatible with installed Burroughs smart display systems. It features a 14-in. CRT screen with 26 lines containing 80 characters.

The keyboard handles both data input and inquiry applications and features 10 programmable function keys, a numeric input area and built-in light emitting diodes to determine data communications status as well as system status, a vendor spokesman claimed.

Data communications takes place at speeds up to 38,400 bit/sec and in continuous transmission in the event of a single system power shut down in a concatenated network.

The workstation also features a maximum of 10 pages of display memory, allowing internal storage of screen formats as well as multiple page operation. Multiple pages may be treated as one large page when editing lengthy documents, a ven-



Burroughs' ET2000 Workstation

dor spokesman said.

The system includes a standard peripheral RS-232C port allowing configuration of I/O devices. A separate printer address may be stored in the terminal allowing printer passthrough of print data directly to the printer while the operator continues keying data on the screen.

The ET2000 is said to be a programma-

ble workstation that includes all the features of the ET1100 plus the Microsoft, Inc. MS-DOS operating systems to allow users to program local and data communications applications.

Configurations include medium-resolution monochrome and color character or bit-mapped graphics.

Screen resolution is 640 by 480 pixels and users can select from eight colors on the character graphics model or eight colors from a choice of 256 on the bit-mapped graphics model.

Using the 16-bit Intel Corp. 8086 microprocessor with a memory capacity of 256K bytes, the ET2000 can be configured with 5¼-in. flexible dual disk drives with 320K, 400K and 1.6M bytes of formatted storage, a vendor spokesman said. Application programs available include those for word processing and Microsoft's Multiplan spreadsheet package.

Three graphics packages will be available — one which will allow the ET2000 to emulate the Tektronix, Inc. 401X graphics terminal, a vendor spokesman claimed. The ET1100 will be available in May for \$1,895. The ET2000 prices range from \$4,095 to \$7,195 for a fully configured color, bit-mapped graphics workstation.

Customer shipments of noncolor units will start in August with color stations available in September from Burroughs, Burroughs Place, Detroit, Mich. 48232.

MDS Updates Winc to Reduce U.S.-to-Europe Telex Costs

PARSIPPANY, N.J. — Mohawk Data Sciences Corp. (MDS) has enhanced its Worldwide Integrated Communications (Winc) Electronic Mail Service to reduce U.S.-to-Europe telex costs by as much as 70%, a company spokesman said.

The service, made possible through a new network communication center in

London, will be operational in May.

Winc network customers in the U.S. will now route their international telex messages via the London center, according to the vendor.

Winc, when combined with MDS terminal systems, reportedly provides subscribers with letter-quality communications.

A message of approximately 1,000 characters can be sent from anywhere in the U.S. to anywhere in Europe for approximately \$1.85, as compared with \$5.76 using standard telex, a company spokesman said.

More information is available from MDS, Seven Century Drive, Parsippany, N.J. 07054.

Conversion Device Targets Floppies

BOSTON — Altext, Inc. has introduced a conversion device said to accept both 8-in. and 5¼-in. floppy diskettes from major vendor word processors such as those from Wang Laboratories, Inc., Xerox Corp. and IBM.

The device is said to allow a floppy diskette from one machine to be read by a different machine.

The Diskreader translates all information into A-Code — a hexademical table which serves as a common ground among systems.

Once converted to A-Code, the alphanumeric data and the command codes from the source systems are then converted into the required hexadecimal codes of the target system, according to a vendor spokesman.

The Diskreader is available for \$12,000 from Altext, Inc., 210 Lincoln St., Boston, Mass. 02111.

Letter-Quality Daisywheel Printer Bows

NASHUA, N.H. — Facit/Dataroyal, a division of Facit, Inc., has introduced a letter-quality daisywheel printer.

The Model 4565 is being marketed mainly for use with Facit word processing systems and other small business applications. The unit reportedly prints fixed and proportional pitch text at up to 40 char./sec using a 96-char. Diablo Systems, Inc./

Qume Corp.-compatible print wheel.

Standard features include a 2K-byte buffer, unidirectional character-by-character printing, bidirectional line-by-line printing, form length and pitch set from control panel and end-of-ribbon sensor.

The unit costs \$1,895 from the vendor at 235 Main Dunstable Road, Nashua, N.H. 03061.

Matsushita File System Boasts Erasable Optic Disk Technology

SECAUCUS, N.J. — Utilizing what is thought to be the first erasable optic disk system, Matsushita Electric Industrial Co., Ltd. and Matsushita Graphic Communication System, Inc. have announced their Optical Document File System.

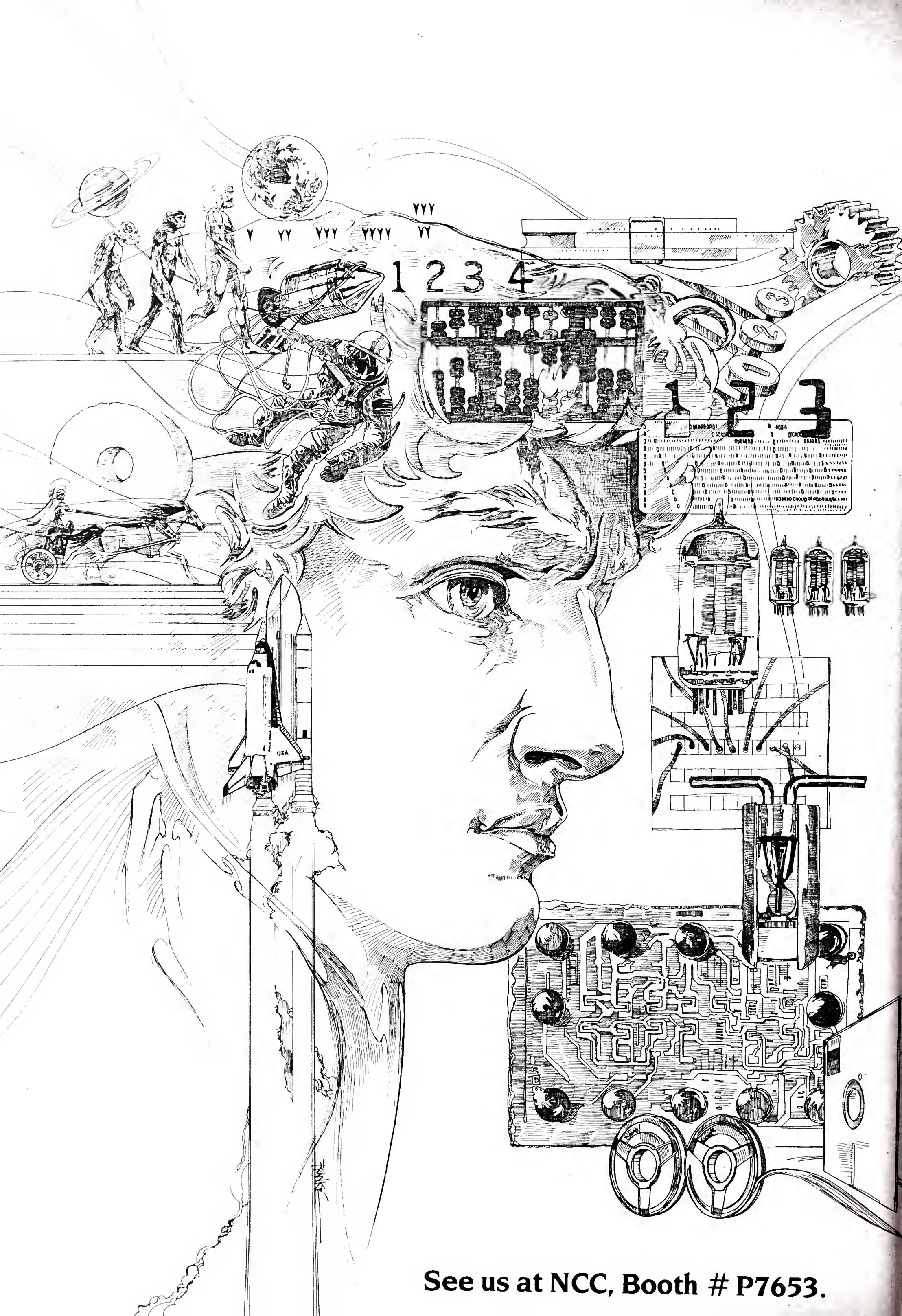
The system is said to record 10,000 letter-size documents on an 8-in. optical disk by using semiconductor laser technology and interface to a facsimile machine for transmission of recorded information. The

unit also interfaces to a still video color recorder for transmission of images, a vendor spokesman said.

The system consists of a main unit for electronic filing, an I/O unit with an optical character reader and printer and an operational keyboard unit. Optical display monitors are available for the system with a resolution of 2479 lines available in either 15-in. or 20-in. sizes.

Using a communication unit, the system can send recorded information to remote locations and be printed out by any facsimile terminals already installed. For the expansion of filing capacity, a retrieving unit, filing expansion unit and graphics transfer unit are also available, the vendor said.

The file system will be available in May for between \$70,000 and \$100,000. Marketing of the product in the U.S. is expected to be handled by Panasonic Industrial Co., 1 Panasonic Way, Secaucus, N.J. 07094.



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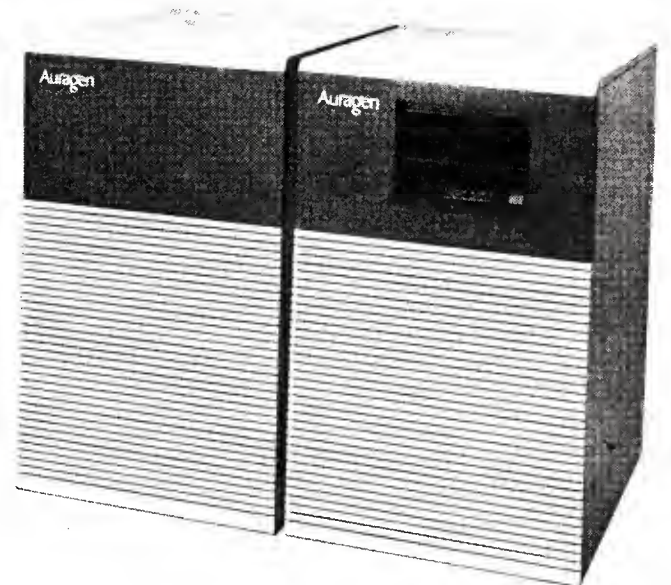
We also provide a full range of interactive productivity tools for programmers, including AURAGEN's full-function relational DBMS and Transaction Processing Management System. Then we've added menus, help facilities, and an English-like query language to make your staff more productive. The extensive communications packages that we provide include SNA, BSC, X.25 and more.

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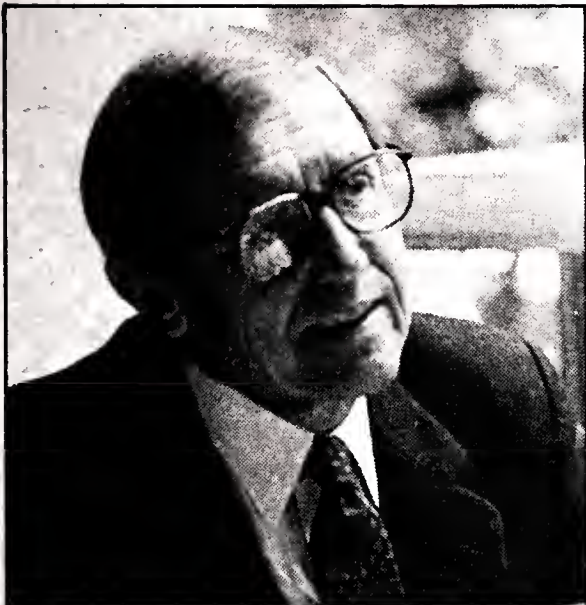
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tain corporate network performance standards. With the help of Series 90, they organize information about network activities in the past, tightly monitor and control the present, and establish an analytical method for anticipating the future.

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CW Photo by P. Gillin

Walter F. Bauer

Bauer Blasts 'Side Door' Policy Of Big Eight

By Lois Paul
CW Staff

BOSTON — Although there should be a limitation on the amount of nonaudit services that a Big Eight accounting firm can provide to its audit clients, this development is an unlikely one given the Reagan administration's policies.

Walter F. Bauer, chairman and chief executive officer of Informatics General Corp., a Woodland Hills, Calif., firm that provides professional services as well as software products, expressed these views during a recent visit here.

Although he feels the Big Eight firms currently tend to handle more of the "front end" of applications rather than doing a lot of programming, Bauer's concern is that they will become a meaningful competitor.

"We are very resentful of that whole thing," he said. "We don't like the idea that they get in through the side door. They don't compete fairly in our minds, because if you are doing the audit work it is pretty easy to get some of the data processing work."

Bauer's concerns once again bring up a controversy that has raged over the charges of conflict of interest that many professional service firms have raised with regard to Big Eight accounting

(Continued on Page 87)

Early First-Quarter Returns Indicate Mixed Fiscal Bag

By Bill Laberis
CW Staff

Early returns on first-quarter earnings indicate a mixed bag of results, as the recession abates in some sectors while its effect lingers in others.

Prime Computer, Inc. announced that its earnings for the first three months of the year would dip about 20%, despite an approximate 10% growth in revenues. Joseph Henson, Prime's president, attributed the slack

earnings to the continuing recession worldwide, the strengthening of the U.S. dollar in foreign markets and his company's purchase of Compeda Ltd. last year.

First-quarter results notwithstanding, Prime is predicting that company profits for 1983 will exceed the \$45 million

Edson D. deCastro, DG president, warned that, 'Any sustained improvement in Data General's earnings in the future continues to be closely tied to a sustained improvement in world economies.'

earned on sales of \$436 million last year. The company further announced that it is "well positioned in terms of products and markets to take advantage of the developing recovery. We expect 1983 to be a good year for Prime and are convinced our investments will be rewarded in future business growth."

Wall Street, however, took a different view, at least in the short term, as Prime's stock nose-dived \$7 when Henson announced the first-quarter earnings' prediction.

One of Prime's chief competitors, Data General Corp., also announced lower earnings in the first three months of 1983, reporting profits of \$5 million compared

(Continued on Page 84)

NTT Reluctant Giant?

Foreign Vendors Covet NTT Slice

By Bruce Hoard
CW Staff

TOKYO — Although Nippon Telephone and Telegraph Corp. (NTT) opened its annual \$3 billion procurement market to foreign communications vendors over two years ago, foreign sales have been low and slow, and NTT has been blamed.

Foreign vendors are understandably covetous of NTT procurements. The \$17 billion government-owned communications monopoly dominates the Japanese telecommunications market, estimated to be the second largest in the world and equivalent in potential to 35% of its U.S. counterpart.

Further enticing outsiders is NTT's declared goal of developing an all-digital, protocol-transparent Information Network System within the next 15 years. At first blush, the Japanese giant looks like a potential gold mine for U.S. high-tech suppliers.

Count American Bell, Inc., the newly formed and unregulated spin-off of AT&T, among them. At the Jan. 18 introduction of the digital Dimension 85 pri-

vate branch exchange, Archie McGill, American Bell's Advanced Information Systems president, commented, "I know

(Continued on Page 83)

Dealers Upset With Store Plan

By Katherine Hafner
CW Staff

WASHINGTON, D.C. — A government plan to accept bids from computer vendors to establish a pilot computer store within the General Services Administration (GSA) to sell microcomputers to federal agencies has a number of computer dealers up in arms.

Basically, these dealers feel that if the government were to set up such a store in collaboration with a single or select group of vendors, it might lock competing vendors out of the highly lucrative government market. Government sources state, however, that establishing such a store —

(Continued on Page 88)

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Stratus's hardware design means that fault tolerance is invisible to your application programs and users. You can even move previously developed applications to Stratus with NO CHANGES and NO PERFORMANCE LOSS for fault tolerance. In contrast, the software-based systems require complex, performance-stealing software in order to implement fault tolerance. This means that new programs are more difficult to develop, they run slower, and existing programs can't be

run without major changes.

An added benefit of the Stratus fault tolerant design is that you can expand your system with additional processors as your computing needs grow. In fact, you can have up to 32 fault tolerant processors, 2000 communication lines, and 100 billion bytes of storage in a single Stratus system.

Hardware Self-checking Causes a Breakthrough in Service.

Each Stratus/32 tests itself EIGHT MILLION TIMES A SECOND while it executes your programs, so faults are detected BEFORE they corrupt your data. And when there is a failure, there's no need to rush to call your Stratus service technician. For one thing, the failed component, be it a CPU, controller, disk, or power supply, has a partner that continues operations as usual (without slowing down the system), so there's NO DOWNTIME. In addition, repairs can be made WITHOUT STOPPING THE SYSTEM. It is so easy to repair a Stratus/32 that our service is provided at about one-half the average price charged by other computer manufacturers.



\$140,000, Software Included.

Our prices are competitive with "normal" systems (i.e. ones that do not provide fault tolerance), and substantially lower than the software-based fault tolerant systems. \$140,000 buys you a complete four megabyte 32-bit system with 60 megabytes of disk storage, magnetic tape drive, and system SOFTWARE. If you like our hardware, you will be even more impressed with our software. (A common reaction among our users.) Briefly, our software offering includes VOS (a virtual operating system), transaction processing, networking, IBM communications, data management system, interactive forms builder, symbolic debugger, COBOL, Basic, PL/I, Fortran, Pascal, word processing. . .

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Foreign Vendors Still Yearn for Slice of NTT

(Continued from Page 81)
we're trying to sell equipment and services to NTT."

However, despite the intense outside interest, closer scrutiny reveals NTT's reluctance to jump head first into the future. According to figures from the Communication Industries Association of Japan, the amount of private sector communications equipment orders over the last five years has risen 18.6% annually, while in the NTT-dominated public sector, the 3.6% increase is markedly lower.

Critics such as Rodney P. Rydlun, deputy director of the Export Development Office at the U.S. embassy here, fear that U.S. communications vendors will reap little of NTT's procurement largess. Rydlun said that he believes NTT's procurement policy is nothing more than a sop concocted to get the U.S. government off the Japanese government's back.

"We shouldn't let down our guard or slack off in the least in our frontal assault in this market," he told *Computerworld* here.

Ichio Kata, director of NTT's International Procurement Department, combatted the critics' charges in another interview here recently. Speaking through an interpreter, he traced the history of procurement negotiations and backed his assertions with a wealth of statistics.

The December 1980 agreement between the U.S. and Japanese governments to open up NTT to foreign procurements has as its genesis the

1973 Multilateral General Agreement on Tariff and Trade (GATT) talks held here, he explained.

At that time, the U.S. proposed to purchase \$14 billion worth of goods from Japan if Japan would respond by purchasing \$4 billion worth of goods from the U.S. Asked if he considered that a favorable balance of

trade for Japan, Kata replied, "Not necessarily."

As a government-owned corporation, NTT would fall under the GATT code. However, as a publicly held corporation, AT&T was buying only a negligible amount from Japan.

The deal was eventually hampered out, and Japan has not suf-

fered for it. As Kata admitted, his country still exports 10 times more telecommunications equipment than it imports.

He noted that NTT has simplified the foreign procurement process by reducing all necessary forms to English and conducting international seminars for prospective suppliers. He also produced statistics claiming NTT's foreign purchases jumped from \$3.8 billion in 1980 to \$4.4 billion in 1981 to \$11 billion last year.

The director of procurement countered charges that NTT concentrates on "low-ticket" items by observing, "Since the implementation of procurement, many U.S. firms have visited NTT. But when it comes to the purchase of the sophisticated equipment, in-depth technical discussion is needed. It takes a longer time."

Although another proffered chart detailed sales of "small-capacity digital [private automatic branch exchange]" and "computer system minicomputer," it was far more notable for such items as "telephone directory paper" and "lightweight headset."

Kata said he has been in contact with more than 200 foreign manufacturers, mentioning such U.S. firms as Rolm Corp., Northern Telecom, Inc. and ITT. Those companies understand how to deal with Japanese customers, while other companies send one-time-only telex messages and never return forms sent to them by his office, he said.

NTT Wants to Go Private

By Bruce Hoard
CW Staff

TOKYO — Nippon Telephone and Telegraph Corp. (NTT) is undergoing changes similar to the ones that restructured AT&T.

Surrounded by one of the world's most advanced electronics industries and under attack from a more sophisticated user public, the \$17 billion communications monopoly wants to become a private company.

Like AT&T, NTT was granted a monopoly over nationwide communications by the federal government. Unlike AT&T, it has yet to be challenged by an unregulated interconnect market that resells its lines.

But, NTT has been challenged by its own girth. Despite \$17 billion in revenues, the company is hobbled by \$15 billion in operating costs. Adding to its woes, NTT's annual expenditures are growing at a 6% clip, while revenues increase at only 4%.

Add 330,000 employees and NTT

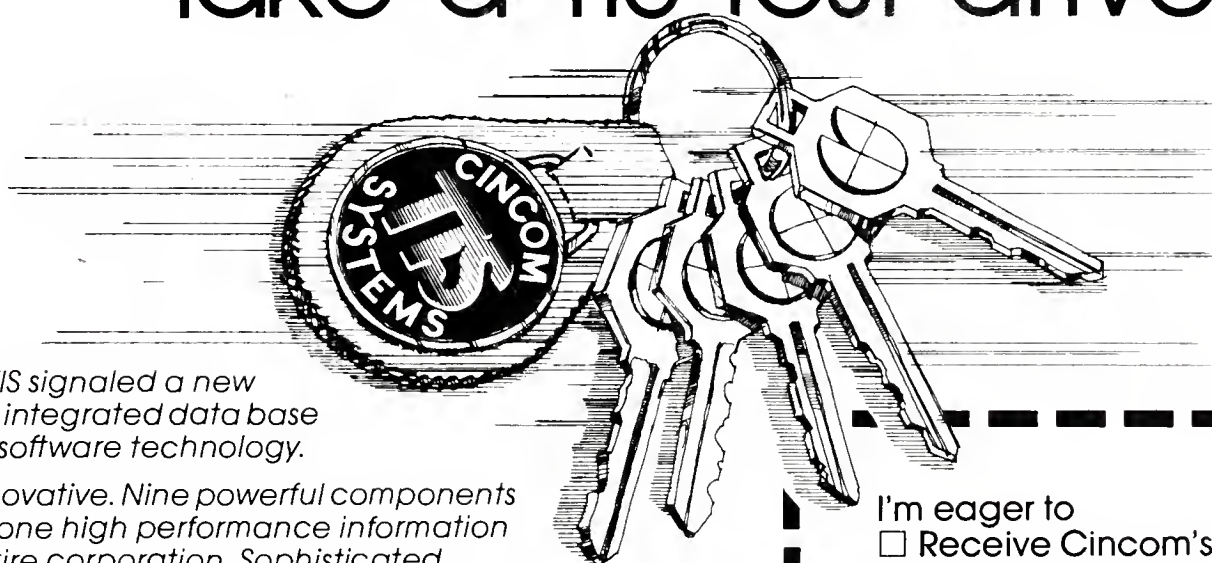
becomes the kind of ponderous giant that Hiroshi Iwaba, director of its data communications bureau exhibition center, wants to scale down.

The second ad hoc committee on administrative reform has suggested that NTT be turned into a special corporation with its entire outstanding stocks held by the government. Within five years after that, a central corporation handling key circuits and several local companies offering local telephone and telegraph service would be created. Finally, stocks of both the central and local corporations would be offered to the public, turning them into private companies.

NTT has expressed its opposition to both that plan and another proposed by the ruling democrat party.

A final decision will not be reached until at least the next session of the Diet — Japan's parliament, scheduled for later this year after elections.

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Former Pepsi President

Scully Elected Apple CEO

CUPERTINO, Calif. — John Scully has been elected president and chief executive officer (CEO) of Apple Computer, Inc. and will also serve as a director.

Scully, the 44-year-old former president of Pepsi-Cola Co., succeeds A.C. Markkula Jr., who will continue as a member of the board.

"We are delighted that an executive with John Scully's exceptional ability and experience has joined Apple to help guide the next phase of our growth," Markkula said. "Under his leadership, Pepsi-Cola Co. during five years grew at a rate outpacing its industry in an intensely competitive environment. Scully brings this record of management achievement to

Apple," he added.

Markkula, one of the company's founders and first chairman of the board, has been CEO since March 1981. He reportedly plans to remain actively involved in Apple's "long-range strategic and technology planning," in addition to his duties as a director.

Steven P. Jobs, chairman of the board, said Scully's election "signifies the next step in Apple's evolution . . . This is a strong addition to our management team and will provide important leadership as Apple continues to grow."

Early Returns Show Mixed Bag

(Continued from Page 81)

to \$5.6 million the same period a year ago. Revenues rose slightly to \$187 million from \$181 million.

Yet investors reacted differently to the DG news of its fifth consecutive quarter of an earnings slide, as its stock price rose more than \$3 the day of the announcement. Analysts said the more optimistic investor reaction to DG's results are pegged to the announcement of its MV 10000 superminicomputer [CW, March 7], reportedly the fastest computer in its class. System shipments are slated to begin later this quarter, DG said.

DG also recently announced a contract with E.F. Hutton & Co., the New York-based brokerage house, to install its CEO Office Automation Systems at some 350 branch offices around the country.

Edson D. deCastro, DG president, warned that, "Any sustained improvement in Data General's earnings in the future continues to be closely tied to a sustained improvement in world economies."

Wang Optimistic

Wang Laboratories, Inc. showed no signs of straying from the high-growth track it has followed for the past several years, announcing that it expects to post record revenues and with earnings of \$25 million for the same period in 1982.

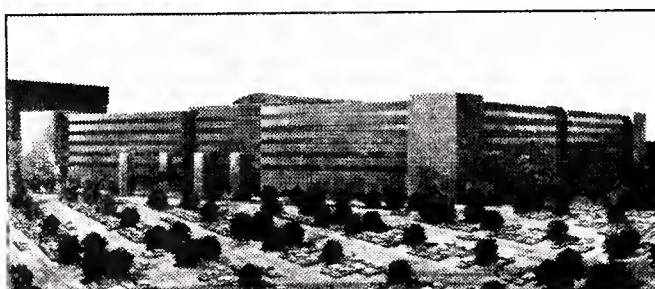
John Cunningham, Wang president and chief operating officer, estimated revenues will jump 32% to \$393 million, while profits will increase 38% to \$35 million, compared to earnings of \$25 million for the same period in 1982.

Wang reported strong interest in its Professional Computer, with shipments of 1,000 units in March expected to rise to 9,000 by June. In response to the recent IBM announcement of its XT hard disk microcomputer, Wang dropped the price of its Professional product offerings.

Monchik-Weber Corp., a software and services firm, reported a quarterly loss of \$250,000 on revenues of \$4.8 million, compared with revenues of \$5.8 million and earnings of \$565,000 reported the same period a year ago.

According to John Weber, company chairman, the revenue and profit slide was attributable to a decline in systems development revenues.

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It means, for example, you can see a customer's file, your inventory levels, production status and the text of a letter acknowledging an order — all at the same time.

Next is a new version of IBM's highly successful Personal Computer: the IBM Personal Computer XT. It can be linked with large host computers, and it comes with its own fixed

disk drive that can store more than 10 million characters or up to 5,000 pages of text or 100,000 names and addresses.

Then there's the IBM 3270 Personal Computer Attachment which does exactly what its name implies. It converts any 3278 display tied to a central computer into a personal computer, simply by pressing two keys.

There's also the new IBM 3178 Display Station, an attractive, low-profile terminal that provides the most popular functions of the widely used 3278 Model 2 display at a significantly lower price. The 12-inch screen can display up to 1,920 characters and swivel or tilt for easy use.

Four new models of the IBM 3274 Control Unit offer dramatic price/performance improvements in directing communications between a host computer and display terminals and printers. Features include a faster, more powerful microprocessor and 50 percent more control storage than previous models — all at the same or lower cost.

Last, but not least, is the new IBM 3299 Terminal Multiplexer. It connects as many as eight terminals or printers to the 3274 Control Unit with a single cable — instead of eight individual cables — significantly reducing installation costs. When these last three products

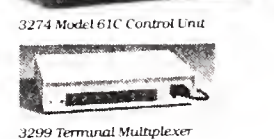
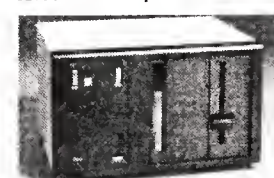
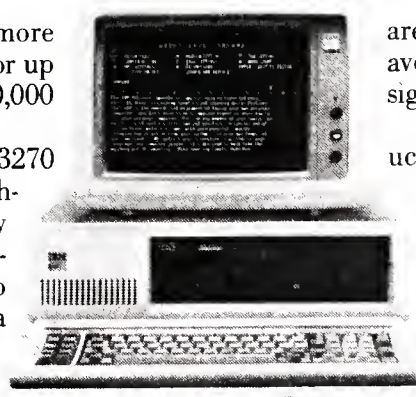
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Dealers Upset With Federal Pilot Store Plan

(Continued from Page 81) which is planned to include products of three computer manufacturers — would not only foster competition, but would help federal agencies keep up with computer technology.

In the last 20 years, the government has procured about 18,000 general-purpose computers. But within the next seven years, the U.S. will purchase one million

computers, a great many of them small microcomputers, estimated William Frazer of the GSA and manager of the project.

Present methods of government procurement of computers currently include a schedule of contracts, or discount catalog and direct vendor sales. Frazer said there is no installation or training available with purchases, a feature that will be

included in the computer store's contract. He maintains the store will be filling a gap between existing means of buying computers for federal use and also help avoid some of the governmental red tape that might prevent federal agencies from lagging behind in the technology.

The federal government wants to set up the pilot computer store inside the GSA

building by September. As an incentive, the GSA has guaranteed to the winner of its bid a minimum of \$100,000 in computer sales to federal agencies over the first 12 months, with a possibility of sales reaching \$2 million or \$3 million in the first year.

If the pilot computer store is successful, similar retail stores will be opened at government installations

throughout the nation.

Computer store owners in the Washington, D.C., area are vexed at what they see as the implications of the plan.

"It's clearly anticompetitive," said Michael Zersace, president of Community Computers in Arlington, Va. "It gives a ridiculous edge to one company. I think it's totally inappropriate for the government to select one vendor over others."

Though Zersace plans to bid on the contract, he said, the bid proposal is worded as if the GSA "already has a vendor in mind," and he considers his chances for winning the contract slight.

In addition, he said, the three manufacturers the federal government has in mind are likely to be Apple Computer, Inc., Radio Shack and IBM. "In order to compete for the bid in the first place, a store will have to carry those manufacturers."

Zersace believes the plan will hurt sales for other vendors considerably. "It would give whichever is chosen a great deal of exposure in the nonfederal market too," he said. "But if you had more people vying for the market, I think you would find better service and lower prices. Monopolies are not traditionally known for low prices and great service."

The GSA's Frazer objected to the word "monopoly," saying it "insinuates there's only one choice."

"This store is going to be purely optional," Frazer said. "It is not required that the federal agencies buy their computer at the store."

"To say it's going to take business away from other vendors is pretty shortsighted," Frazer maintained. "The visibility of the products will tremendously increase people's awareness of technology and benefit everyone."

Frazer expects to make a decision on the bid between May and September. Some 50 local vendors have already requested bid proposals, he said.

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Biggest East Coast Haul Yet Eighty Fake Apples Seized in Philadelphia

By Robert Batt

CW West Coast Bureau

PHILADELPHIA — With a series of raids across this city, police and federal agents last month effected the biggest haul of counterfeit Apple Computer, Inc. Apple II computers and components yet discovered on the East Coast.

The lawmen seized 80

fake Apple machines, the parts for 100 more and confiscated business records belonging to Taiwan Machinery Trading Co., the firm believed to be responsible for the sale of fake Apples in Pennsylvania.

No one was arrested during the raids, which took place in two apartments, two suburban homes and a busi-

ness residence. Information gathered, however, has been presented to a grand jury investigating possible mail fraud, copyright infringements and smuggling.

The haul is the latest by federal officials in their attempt to stop the growing black market for Apple computers.

For more than a year, Ap-

ple has been pressing the federal government to halt what it considers to be the unfair and illegal trade in look-alike Apple IIs [CW, March 7].

The company recently asked the U.S. International Trade Commission to initiate a formal inquiry into the alleged malpractices, thought to emanate mostly from Tai-

wan and Hong Kong.

"The events in Philadelphia are significant in that it is the first time that federal agents have uncovered counterfeit machines on their own initiative. We feel these raids are the direct result of the efforts we have been making to educate federal officials," according to a spokesman for Apple in Cupertino, Calif.

Although the haul was the biggest to date on the East Coast, it is small compared with the 500 or so machines and components that were uncovered in one swoop on the West Coast last year. The computers in Philadelphia were each being sold for less than half the cost of a U.S.-made Apple II. Edward Borden, assistant U.S. attorney, said investigators seized 50 computers that had been sold to undercover law enforcement agents, with 30 more confiscated from an apartment in the city.

Police narcotics officers discovered the haul when they raided one of the apartments in a drug probe.

IMP Denies Complaints Filed by AMI

SAN JOSE, Calif. — In two separate pleadings filed in U.S. District Court here recently, International Micro-electronic Products (IMP) formally denied the complaints against it contained in a suit filed previously by American Microsystems, Inc. (AMI).

In its countersuit, IMP charged AMI with restraint of trade and unfair competition and harassment, asking for \$30 million in punitive damages and an injunction restraining AMI from continuing the alleged unfair practices.

Zvi Grinfas, IMP's vice-president, said his company's response indicates AMI was "not the first to conceptualize or develop the buried-diffusion process" used in the development of computer-aided design software.



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Poll Finds OA Opening Up New Opportunities

By Bill Laberis
CW Staff

TROY, Mich. — Ninety-four percent of electronic office equipment operators polled recently said their skills have opened up opportunities for advancement within their companies, according to a survey conducted by Kelly Services, Inc., a leading supplier of temporary clerical help.

Kelly questioned support staff selected from the 1,350 largest companies nationwide, including secretaries, administrative assistants, clerk typists, word processing and data processing professionals and keypunch operators.

The automation process, the survey found, was generally a smooth one, with more than 90% of those questioned indicating their companies handled the automation transition very well or moderately well. Seventy-five percent of those polled said the introduction of automation did not cause personnel problems.

While word processing is gaining greater prominence within the office environment, data processing is reaching maturity, the Kelly survey said.

This contrast can be seen in the respective impact of each on training and office

procedures, Kelly said.

For example, 66% of the WP operators said they were trained in word processing within the past three years, and nearly half of those in the last year. Eight out of 10 said they learned to operate their machines at their present job, the survey continued.

The two sources of WP training most frequently utilized were either a vendor

representative (34%) or an in-house staffer (29%), according to the survey. Ninety-five percent of those who described themselves as WP operators were women.

Data processing, on the other hand, has already been integrated into mainstream office operations, the Kelly survey found. Forty percent of DP technicians surveyed received their instruction seven or more years ago, and

half of those surveyed said they were trained on the equipment before accepting their current positions.

Automating the office did bring a certain level of apprehension, the survey continued, with over half the workers and their managers acknowledging some fear when the equipment was first introduced. Managers polled, however, said they did not know the source of

worker concern. Support staff cited computer fear (30%) as the greatest worry during the automation changeover.

But once workers were trained, their positions as a whole improved, according to 90% of those polled. Seventy-eight percent said they were able to exercise greater responsibility and decision-making authority within their companies.

"Hyatt was a pioneer of local area networks. When Datapoint introduced the first one, we ordered."

—Bob Regan
V.P. Management Information Systems
Hyatt Hotels Corporation



"Local area networks are the hot topic in data processing these days. But they're nothing new to us," says Hyatt's Bob Regan. "Ours have been up and running for five years."

When Datapoint introduced the first local area network, the ARC® system, in 1977, Hyatt was among the first to install it. Today there are approximately 5,000 ARC local area networks in use, far more than any competing system.

"One reason the ARC network has been so effective for Hyatt is because it's easy to expand," says Regan. "Hyatt has had phenomenal growth, and the ARC has kept up. When more people needed the system to do more work, we simply added to the network."

The ARC local area network can be expanded virtually without limit by simply plugging in additional Datapoint processors, printers, storage disks, and terminals. Each new processor adds power to the

network so new users get the same fast response the original users were getting. Companies can closely match the power of an ARC system to their needs, expanding in small, inexpensive increments instead of buying "more computer than they need" in order to have room for growth.

What's more, Datapoint systems can be expanded or upgraded without replacing software. "We run some programs on ARC networks that were originally written for our first Datapoint computer more than ten years ago," says Regan. "That means we didn't lose any of the money we invested in programming and training. And it made the growth steps easy on our people. The changeover to the ARC network was accomplished in only two days."

No matter how far an ARC system is expanded, all the users can have access to all the data except where security precautions are installed. So even though more and more people are using more and more computers, there's never a

need to duplicate files.

"At present, Hyatt operates forty-five ARC systems," Regan says. "Others are in the planning stages right now. On the operations side we use them for accounting, reservations, and group sales. At Corporate we use them for accounting and for systems development. Obviously, we depend on them heavily. They're like the meters where we check our own financial performance. They simply have to work. And they do."

"Hyatt has stayed with the ARC system because it's been cost-effective. That's the bottom line. I can recommend a certain system to a hotel, but in the end, the system has to sell itself. And keep selling itself after it's installed. Our Datapoint ARC systems have done that."

For more about Datapoint, call (800) 531-5639. In Texas, call (800) 292-5099. Telex 767300 in the U.S.; 06986622 in Canada; or 923494 in Europe (UK). Or write Datapoint Corporation, Marketing Communications T41CW, 9725 Datapoint Drive, San Antonio, Texas 78284.



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Forecasts & Findings

Micro Market Exploding

The market for personal computer software will undergo explosive growth during the next five years, with worldwide expenditures rising from \$945 million in 1982 to \$6.7 billion in 1987, according to **Personal Computer Marketing Opportunities** by Input, Inc.

The U.S. share of that market will increase to \$3.7 billion in 1987, growing at a compound annual rate of 42%, the report said. This compares with a 24% annual growth rate in the U.S. computer services industry and only a 3% to 4% growth rate in the economy as a whole, the study continued.

Priced at \$2,000, the study is available from Input, 1943 Landings Drive, Mountain View, Calif. 94043.

Bank Info Systems On Rise

The market for wholesale banking information systems will total nearly \$1.8 billion during the period from 1982 to 1991. Annual sales will grow from \$59 million in 1982 to \$225 million in 1991, with a peak of \$235 million in 1989, according to **Wholesale Banking Information Systems Market**, by Frost and Sullivan, Inc.

Integrated information systems will take 35% of the market, the firm predicted. Primary markets for such systems are banks with overseas operations and large domestic banks. The firm also projected that shipments of overseas office data communications networks required to support distributed data base systems will amount to 27% of the total market. Furthermore, spending on the distributed data bases themselves is expected to take 10% of the total market.

Sales of money transfer systems are forecast to total \$223 million — 12% of the overall market. The report (#A986) costs \$1,150 and Frost and Sullivan is located at 106 Fulton St., New York, N.Y. 10038.

Electronic Publishing Up

The steady growth experienced by the data base/electronic publishing industry in 1982 is expected to continue in 1983, according to **Data Base/Electronic Publishing: Review and Forecast, 1983**, by Knowledge Industry Publications, Inc.

On-line revenues increased 30% overall in 1982 to \$905 million and are expected to jump another 26% in 1983 to 1.14 billion, the study said. Also in 1982, the business/professional segment grew 28% and the consumer segment 113%.

While the microcomputer is seen holding the key to a mass market for electronic publishing, well over 90% of the revenues come from the business/professional market, according to the study.

Those revenues are expected to grow another 23% in 1983, and revenues from consumers are expected to more than double.

The report is priced at \$225, or \$150 to IDP newsletter subscribers, from Knowledge Industry Publications, 701 Westchester Ave., White Plains, N.Y. 10604.

Lottery Launched for IBM Users

ANDOVER, Mass. — Step right up and win a free financial software package for your IBM mini-computer or mainframe.

Software Sweepstakes '83, the new marketing approach being undertaken by Software International Corp. here, will give a company in each category of equipment — IBM System/34, System/38 and a large-scale IBM or plug-compatible mainframe — a free perpetual license to use one of its software packages.

According to Software International's group vice-president for national sales, Anthony E. Mauro, "a company with an IBM 360/370, 4300, [30 series] or plug-compatible mainframe operating

in either OS or DOS, for example, could win a general ledger and financial reporting system worth from \$53,250 up to \$72,250."

Users of the smaller IBM models, such as the System/34 or System/38, can choose from among general ledger, accounts payable, human resources management, fixed assets or payroll/personnel offerings, he added. "An IBM small system shop, therefore, could win a package ranging from \$15,400 up to \$38,000," Mauro explained.

The sweepstakes entry forms are already in the mail to 55,000 hardware users. All entries must be received by 5 p.m., April 27, 1983. The respective winners will

be drawn on April 29, 1983 and notified via Mailgram.

The winning companies must sign a Software International lease agreement that will entitle it to receive everything normally considered in acquiring a software package.

This is comprised of source code, documentation and one free year of maintenance, including warranty, customer service and all scheduled enhancements, the vendor said.

Further information about the Software Sweepstakes can be obtained by contacting Software International, One Tech Drive, Andover Tech Center, Andover, Mass. 01810.

It used to be frightening to outgrow a 4300.



Anyone who has ever outgrown IBM's 4300 Series knows about the bear-sized gap between the 4300's and the 3083. In performance and in price!

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A Total \$14.2 Million Investment

Four U.S. Firms to Locate Operations in Ireland

SAN FRANCISCO — A visiting dignitary has announced that four U.S. electronics companies have decided to invest a total of \$14.2 million in installations in Ireland, contributing to the rapid growth in the Irish electronics sector.

The companies are: Adda Corp. of Campbell, Calif., Compucorp, Inc. of Los Angeles, Western Digital Corp. of Irvine, Calif., and Prime Computer, Inc. of Natick, Mass., according to Irish Cabinet Minister for industry and energy John Bruton.

The companies decided to invest in Ireland following discussions with the Industrial Development Authority (IDA) of Ireland, the Irish

government agency established to attract overseas industrial investments. Compucorp has agreed in principle to establish a \$6.9 million project in County Cork to manufacture office automation systems for international markets. The plant will include a research and development center, employing engineers in data communications and networking techniques.

Western Digital will move into a 42,000-sq-ft. facility in the IDA-Ireland Industrial Park at Kilbarry, Cork, for the production of disk controllers and other electronics products. The company's first manufacturing venture in Europe, the project involves an investment of \$3.2 mil-

lion in the plant and facilities.

Adda will locate its new operation at the 25,000-sq-ft. IDA-Ireland advance factory on the Industrial Estate at Waterford, investing \$1.6 million to manufacture electronic equipment for the broadcasting industry.

Prime Computer, which established its first Irish plant in 1980, will expand its present facility at Coolock, County Dublin, with a nearby \$2.5 million software development center to be incorporated into the company's range of mini-computer products.

Bruton said IDA's strategy is to maximize opportunities arising from the expansion of the electronics sec-

tor in Ireland by encouraging and assisting the growth of the Irish supplier companies. He said the electronics industry in Ireland is growing at an annual rate of 22%.

Study Predicts Growing Use Of Teletext

MENLO PARK, Calif. — As many as 38% of U.S. households will be using their television sets to obtain information services via teletext by 1990, according to a study published recently by the Institute for the Future (ITF).

The 200-page study, titled "The Market for Teletext in the United States," claims that teletext, the one-way transmission of text and graphics to low-cost terminals such as television sets, will provide news, weather, sports scores, stock market results, television schedules, consumer information and educational materials.

The ITF study also projects that teletext will grow more rapidly than two-way videotex and will offer competition for many videotex services.

Teletext was recently authorized by the Federal Communications Commission as a commercial service.

The study is available for \$2,000 from ITF at 2740 Sand Hill Road, Menlo Park, Calif. 94025.

TRW-Fujitsu Announces Name Change

LOS ANGELES — The TRW-Fujitsu Co. has changed its name to Fujitsu Systems of America, operating as a subsidiary of Fujitsu America, Inc., a spokesman for the company said.

The name change is a result of the recent restructuring of the relationship between TRW, Inc. and Fujitsu Ltd., whereby Fujitsu's wholly owned subsidiary, Fujitsu America, will assume 100% ownership of Fujitsu Systems of America, a spokesman said.

Fujitsu Systems of America will continue to operate out of the company's Los Angeles headquarters.

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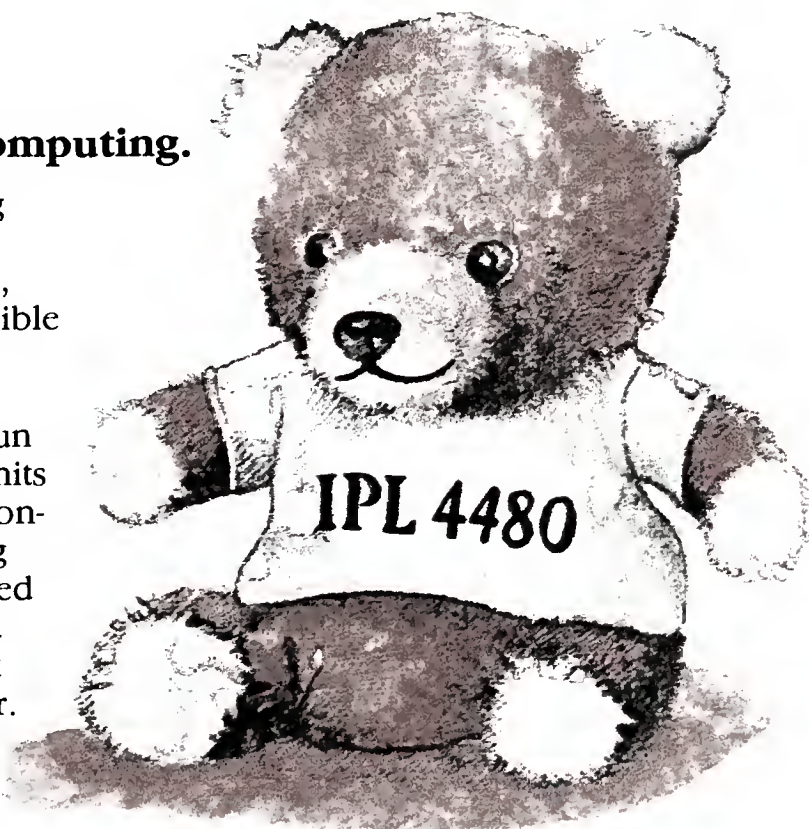
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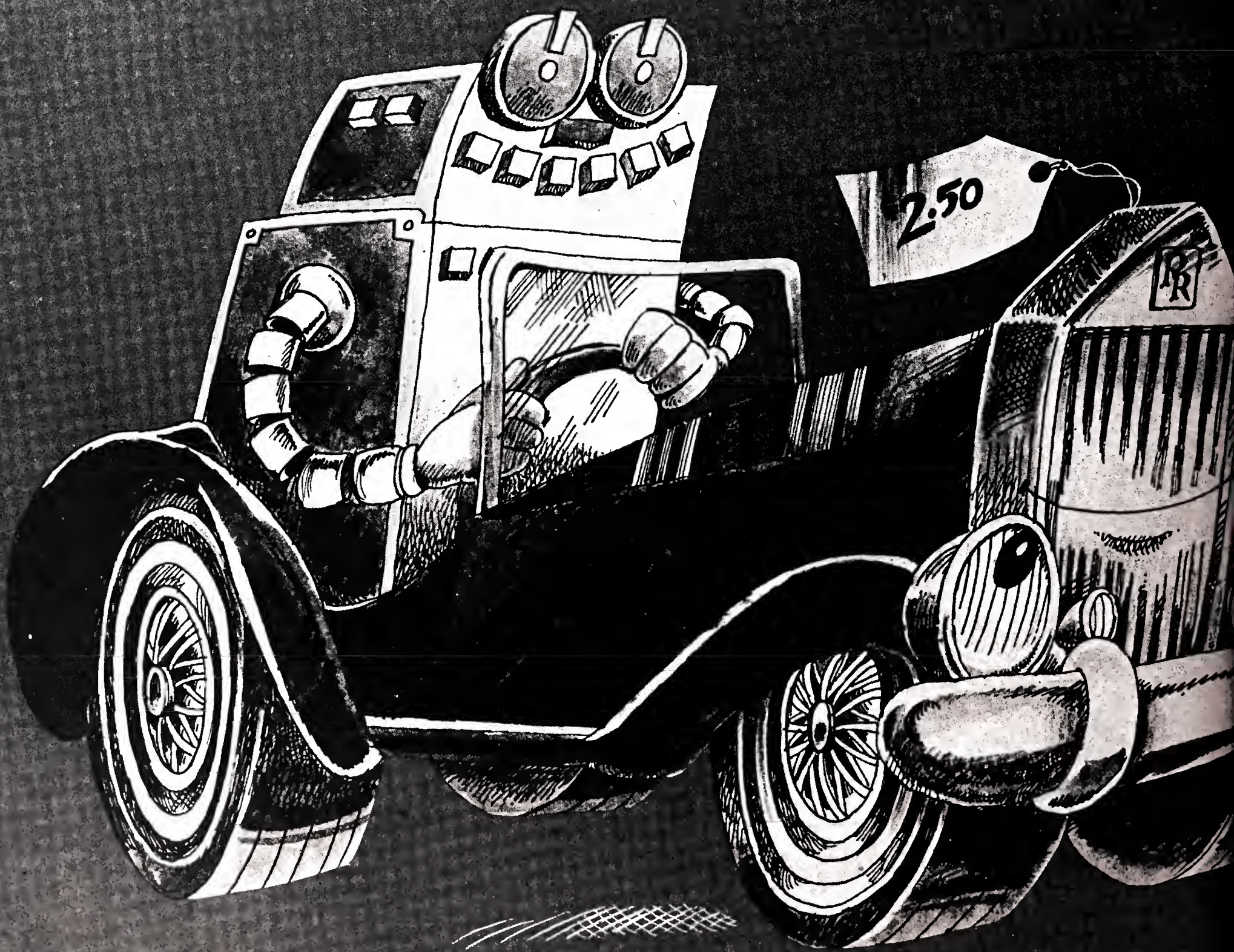
For more information about the IPL 4480 Continuous Compatible Computer, contact Manager of Market Support at IPL Systems, Inc., 1370 Main Street, Waltham, Massachusetts 02254, (617) 890-6620.

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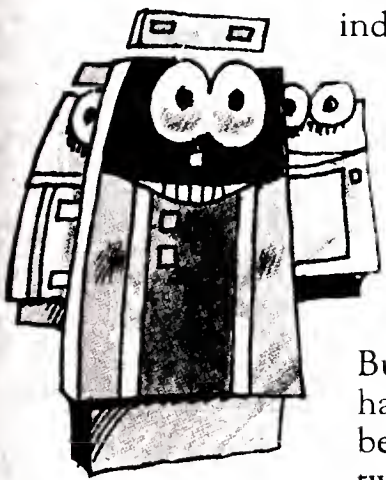


Computers aren't just an industry, they're a revolution in the way mankind operates. And no one covers this revolution better than we do!

We are CW Communications/Inc. and despite our youth (only 15 years) we're the world's largest publisher of newspapers and magazines for computer people all over the world.

Most of our publications are weekly newspapers, because so many things happen so rapidly in the computer business (as the headline quote from a prominent industry executive makes so clear). In

only thirty years the industry has gone from the development of the giant Eniac system, through the tube-powered, water-cooled Univac I (the world's first business computer), to the incredibly cheap, battery-powered microprocessor.



But as unbelievable as the last 30 years have been, the next 30 will probably be even more incredible. In the next two years alone, installed power of general purpose computer systems will grow almost as much as it did in the previous 16 years. And the supercomputers of the 90's will transfer data at a rate several hundred times faster than even today's speedy computers! It's hard to remember this is real science, not fiction.

This extraordinary increase in efficiency has led to a rapid expansion in computer use, as human ingenuity finds more and more applications for these powerful tools. So the market for computer products and services has turned out to be more elastic than most observers had thought.

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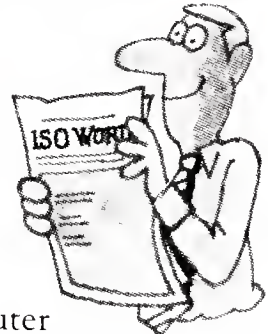
A constant flow of new products; rapid changes in technology; more and more new applications; and large and growing expenditures. It's an industry with strong need for current, complete and accurate information. Which is where we come in.

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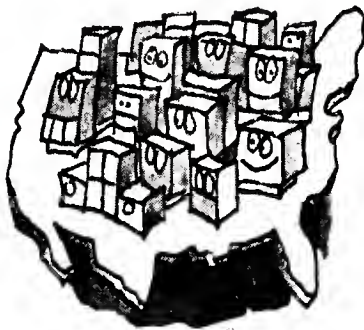
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Senior Programmer/Analyst — Minicomputer COBOL. Lead the development of complex integrated manufacturing applications with full technical and user responsibility. Three to five years of manufacturing applications development using COBOL and minicomputers helpful. To \$32,000.

Systems Programmer — Install Distributed Networks. Dedicated data service company of Fortune 500 organization will install over 200 new sites in 1983. Knowledge of MVS and Teleprocessing protocols desired. To \$42,000.

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Programmers — Learn Graphics. 50% annual growth in this Boston-based developer of graphics mini-computers creates the need for experienced FORTRAN, PASCAL and Assembler Programmers. Engineering background preferred. To \$33,000.

Project Manager — Build A Staff. Assume responsibility for three Programmer/Analysts and expand this group to nine in next eighteen months; will install complete distributed MRP system. Five years manufacturing systems and supervisory experience desired. To \$41,000.

Systems Analyst — International Travel. Prestigious firm needs a Systems Analyst to oversee the systems requirements of multiple distributed systems in North, South, and Central America. 30% travel required. Background in financial applications and IBM computer systems preferred. To \$35,000.

Senior Sales Representative — Management Potential. Boston suburbs-based data processing service organization seeks an eight-year experienced sales professional who is familiar with the IBM product line to become Manager. Base to \$35,000 (\$55,000 at 100% of objectives).

Applications Programmer — IMS Training Provided. Boston-based international manufacturer/distributor seeks experienced COBOL Programmers to participate in new applications development. IBM COBOL experience desired. To \$28,500.

Systems Programmer/Minicomputer Vendor. World's leading manufacturer of small systems requires a Systems Programmer for in-house IBM 3033. Knowledge of OS/MVS preferred. Will train in CICS. Future mobility to minicomputer software development group. To \$42,000.

Project Leaders — New Corporate Data Center. Major medical services firm is implementing a new corporate data center and seeks experienced Project Leaders with marketing and manufacturing systems experience. IBM OS/COBOL experience preferred. To \$38,000.

Senior Systems Consultant. Opportunity to apply a multiple language, multiple technology background in a marketing support position implementing varieties of distributed processing systems for a major New England computer vendor. Local travel involved. To \$45,000.

Systems Engineers. Two positions for people with knowledge of minicomputer business applications or word processing systems and RPG II or COBOL programming. Rapid advancement. To \$26,000.

Senior Assembler Programmer/Analyst. Opportunity to develop new interactive system software for both IBM and DEC computers for firms specializing in investment analysis and financial management systems. To \$40,000.

Senior Systems Programmer. Outstanding opportunity to develop special software for a new LSI-11 based microprocessor system. Degreed professional with five to ten years experience with FORTRAN and Assembler on DEC equipment sought. Will write data analysis routines and report generators. To \$35,000.

Senior Systems Programmer. Key position for the development of performance software to run on IBM computers. Degree and ten to fifteen years experience plus a knowledge of BAL and IBM Architecture preferred. Will develop software to run without the benefit of an operating system. To \$39,000 plus stock options.

Minicomputer Programmers/Graphics. CAD/CAM industry leader requires professional to develop applications and systems software. Requires Assembly language or FORTRAN in a mini/micro environment. Mechanical engineering experience preferred. To \$35,000.

Programmer/Analyst. Prestigious New England consulting firm specializing in major data base/data communication systems development requires an Analyst with three years experience in IMS, IDMS, CICS or TOTAL and COBOL. To \$39,000.

Systems Programmer — Install 3033/MVS/IMS. Suburban Boston-based Fortune 500 company seeks an experienced Systems Programmer to plan and implement an additional 3033 OS/MVS. Will also be responsible for new IMS installation. To \$37,000.

Senior Programmer. Major banking service corporation requires good Assembly language skills at all levels to help in major on-line systems development effort. Banking background and CICS preferred. To \$32,000.

Systems Programmer/IMS Training. Fortune 500 organization with national headquarters in a Boston suburb seeks a Systems Programmer from an OS/MVS environment. Training in IMS and Teleprocessing provided. To \$34,500.

Director Systems Engineering. Key individual will manage the applications group and the systems group in the development of a performance monitoring system. Degree and experience in applications and systems development on IBM mainframes and DEC microprocessors preferred. To \$45,000 plus stock.

DEC Minicomputer Programmer. Install VAX's in a highly complex distributed processing system environment. Systems will be used to control a major international application. Two years of Basic plus programming on DEC PDP or VAX computers and financial application knowledge sought. To \$26,000.

Diagnostics Programmer — Graphics. Work on graphics systems diagnostics software for small company. Requires at least two years of diagnostics software experience with microprocessor based products. To \$38,000.

Technical Representatives. Join a successful vendor field support organization. Positions represent a chance to "get out of the office," make high level contacts in the industry and become the expert on software products of communication systems. Four years technical background which includes IBM Operating Systems, Project Leadership or T.P. knowledge a plus. To \$45,000.

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Software Engineer. Technical and management growth opportunity. Southern Connecticut-based internationally-known information service company needs an Engineer to develop on-line real-time mini/micro based systems. To \$48,000.

Project Leader. Leading firm seeks a Project Leader to direct staff of six Programmer/Analysts and two Analysts in the development of on-line data base distribution and manufacturing system. Prior programming background helpful but not required. To \$36,000.

Marketing Representative — Outstanding Potential. New Southern Connecticut branch of major computer services vendor offers territory growth opportunities. Best compensation package in industry: Average 1982 earnings \$76,000 in 1982.

Programmer/Analyst — Training Provided. Nationally-known service, entertainment, recreation, and equipment manufacturer needs a Programmer/Analyst. Will learn and use data base/data communications skills in major new development projects. One year of COBOL, PL/I, BAL preferred. To \$28,000.

Systems Programmers — Move into Technical Management. Major firm who is converting to 3033/4341 environment needs OS, DOS/VS, VS-E, Systems Programmers. DB/DC experience or system generation/tuning experience on any IBM system helpful. \$24,000 to \$38,000.

Systems Design Engineer. Staff position in R&D systems development group for major computer-based terminal systems vendor. Experience in mini/micro systems hardware and software design with exposure to real-time terminal-based systems desired. To \$42,000.

Programmer/Analysts — IMS Training. Leading edge user of IMS DB/DC design seeks several individuals for applications development, data dictionary, DB/DC design, and technical support positions. Two years IBM 370/OS COBOL or BAL with exposure to DB/DC concepts preferred. To \$27,000.

Systems Programmers. Fortune 500 financial organization with multiple suburban data centers seeks individuals with two years experience in MVS, IMS or TCAM internals. Excellent opportunity for training and advancement. To \$36,000.

Tech Services Group — Systems Programmers. Ground floor opportunity to head the Tech Services Group of a new division of this Fortune 500 corporation. Environment will be 4341 OS/MVS, DL/I and CICS. Will hire own staff of three to four Systems Programmers. Two years OS/MVS, DL/I or CICS experience sought. To \$45,000.

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CICS Programmer/Analysts — Team Leader Potential. Suburban employer seeks Programmer/Analysts for new development project with potential for promotion to Team Leader. Two or more years IBM OS/COBOL and Command Level CICS experience sought. To \$34,000.

Manager of Software Engineering — New Development. Major R&D division of leading firm seeks Software Engineer with state-of-the-art technical and supervisory skills to manage all new development of advanced microprocessor based systems. UNIX, 'C' or PASCAL, and M68000 backgrounds are highly desirable. To \$52,000.

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CAD/CAM Programmers. Several openings with major companies actively involved in R&D of sophisticated design engineering, automated manufacturing, robotics, and automated test systems. To \$39,000.

Corporate Consultant — MIS Director Potential. Define requirements and opportunities for use of computer technology in subsidiaries of this Fortune 50 organization. Salary + bonus to \$65,000.

Systems Analyst. Lead the evaluation, design, development, and implementation of all new manufacturing and related systems for this well-known international firm. Prior background in programming sought. To \$40,000.

Senior Software Engineer. Senior staff position with Fortune 50 company responsible for corporate consulting projects involving the development of real-time mini/micro-computer-based systems. Strong project management and application experience. To \$50,000.

Programmer/Analysts. Hartford suburban employer seeks individuals with two years IBM 370/OS COBOL development programming for new development project. Potential for promotion to team leader positions. To \$31,000.

Internal Consultant — Distributed Processing. Fortune 500 organization with headquarters in Hartford seeks an Internal Consultant with experience in IBM 8100/3033 technologies. CICS, IMS and minicomputer experience preferred. To \$35,500.

Programmer/Analyst. Multidivision Fortune 500 manufacturer seeks professionals with two years IBM OS/COBOL programming and analysis experience. Position entails development and support of financial and manufacturing systems in COBOL with CICS and TOTAL (DBMS). To \$28,000.

Senior Systems Programmer. Fortune 50 diversified financial institution with headquarters in Hartford suburb seeks a Senior Systems Programmer with large IBM mainframe experience for a highly visible internal consulting role. CICS and IMS exposure desired. To \$34,300.

Senior Technical Consultants. Major suburban Hartford firm with large state-of-the-art IBM environment desires individuals with five or more years of EDP experience to design, test and install on-line and data base oriented systems. To \$34,000.

Senior Programmer/Analyst — CICS. Suburban Hartford organization seeks an individual with two or more years CICS (Command) and Financial applications background to work on a new payroll system. Excellent relocation incentives. To \$30,000.

Minicomputer Software Engineering — Ground Floor. Lower Fairfield County engineering firm starting up new function at this site. Need two year micro Assembler Programmers. To \$39,000.

Software Engineer. Fortune 500 central Connecticut-based firm with real-time microprocessor based software applications in Assembly and PL-M seeks an Engineer for various close-loop test applications including environmental support and satellite control systems. B.S.E.E. or B.S.C.S. and three years programming and design with Intel 8080, Z-80 or Motorola 6800 preferred. To \$40,000.

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Systems Software — Develop your own Operating System. Computer manufacturer opens new R&D center on Fairfield County Border. Chance to write original software for internals, data base and telecommunications. Previous MVS internals helpful. To \$55,000.

MIS Director — Manufacturing. Divisional headquarters in lower Fairfield County needs a degreed MIS professional to direct all data processing for this manufacturing company. Previous IBM 4300 and manufacturing systems sought. To \$55,000.

Programmer/Analysts — Learn CICS/DL/1. Major lower Fairfield County, Connecticut firm seeks qualified two + years VSE/COBOL Programmer/Analysts with distribution or financial systems. Will learn on-line database. To \$32,500.

Systems Analyst — Move up to Project Manager. This Lower Connecticut communications firm needs a Senior Systems Analyst to review, design and implement an on-line CICS-driven, corporate-wide information system. A strong OS/COBOL background needed. To \$42,000.

Programmer/Analyst — Cross Train IBM/HP. Rare opportunity for COBOL Programmers to learn either OS/CICS or HP/IMAGE. This Fairfield County manufacturing firm will cross-train on one computer if you have either experience. New projects available. To \$36,000.

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Internal Systems Consultant. Interface with data base staff, systems staff, applications programming staff and users in tuning existing systems and maximizing efficient design of new IMS DB/DC systems. Degree and knowledge of Data Base (IMS or IDMS) and MVS operating systems preferred. To \$37,500.

Systems Analyst — Become a Data Base Analyst. Function as Technical and Design Advisor to group of 32 Programmer/Analysts and Project Leaders implementing DB/DC systems. At least three years designing and programming data base systems desired. To \$35,000.

Programmer/Analyst — Move Into Software Development. Four year old well-respected minicomputer software development company is expanding into new markets and needs a professional with two or more years of minicomputer Assembler or COBOL. To \$31,000.

Minicomputer Programmer/Analysts — New Development. New England-based computer manufacturer needs people to join a new department which is being formed to install both MIS and real-time manufacturing systems. Needs Minicomputer Programmers experienced in COBOL or Assembler programming. To \$34,500.

Systems Programmer — Premier IMS New Hampshire Data Center. Multiple CPU MVS/IMS DB/DC data center requires a Systems Programmer for tuning and internal consulting for performance maximizing. Three years of MVS, Data Base knowledge and IMS preferred. To \$35,000.

Senior Programmer/Analyst — New Data Base Opportunity in New Hampshire. Major new on-line data base installation requires three years of data base design experience using IMS, ADABAS or IDMS. To \$32,000.

Programmer/Analyst — Rhode Island. Large northern Rhode Island firm seeks professional with three years OS/COBOL experience. CICS training provided. To \$26,000.

Software Engineers/Programmers — Voice/Data Communications. Fast-growth company developing exciting new voice and data communication technology. Three years experience programming in 'C' and Assembler under UNIX or RSX-11M preferred. Package includes stock. To \$30,000.

Senior Analyst — IMS Training. National insurance company seeks an individual with experience in OS/COBOL environment. Insurance background preferred. Will train in IMS. To \$28,000.

Minicomputer Programmers. International hardware manufacturer seeks individuals with experience in COBOL or PL/1. Will develop internal manufacturing applications to be used in a distributed data processing network. Will train in telecommunications. To \$28,000.

Senior Software Development Engineer. Peripheral manufacturer seeks individual with a strong background in microprocessor Assembler. These positions are in the new products area for developing floppy disc subsystems and advanced printer firmware. B.S., Electrical Engineering desired. To \$36,000.

Scientific Programmer/Analyst — Real-Time Systems. Major coastal Rhode Island consulting firm seeks a professional with real-time programming experience in FORTRAN or Assembler on DEC PDP-11 or other similar equipment. To \$33,000.

Programmer/Analysts. Rhode Island organization with IBM 4341 DOS/VSE will train PL/1 and COBOL Programmer/Analyst in DB/DC medical applications. To \$27,000.

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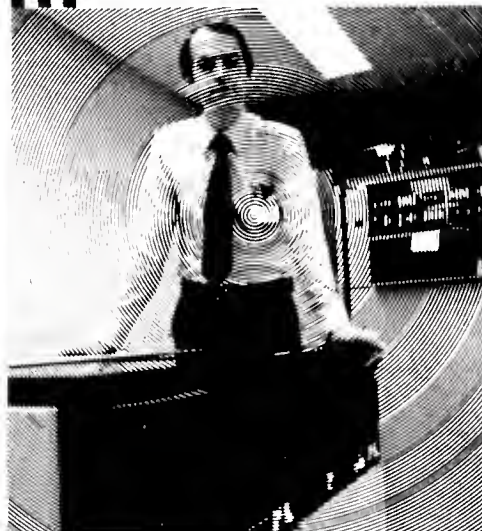
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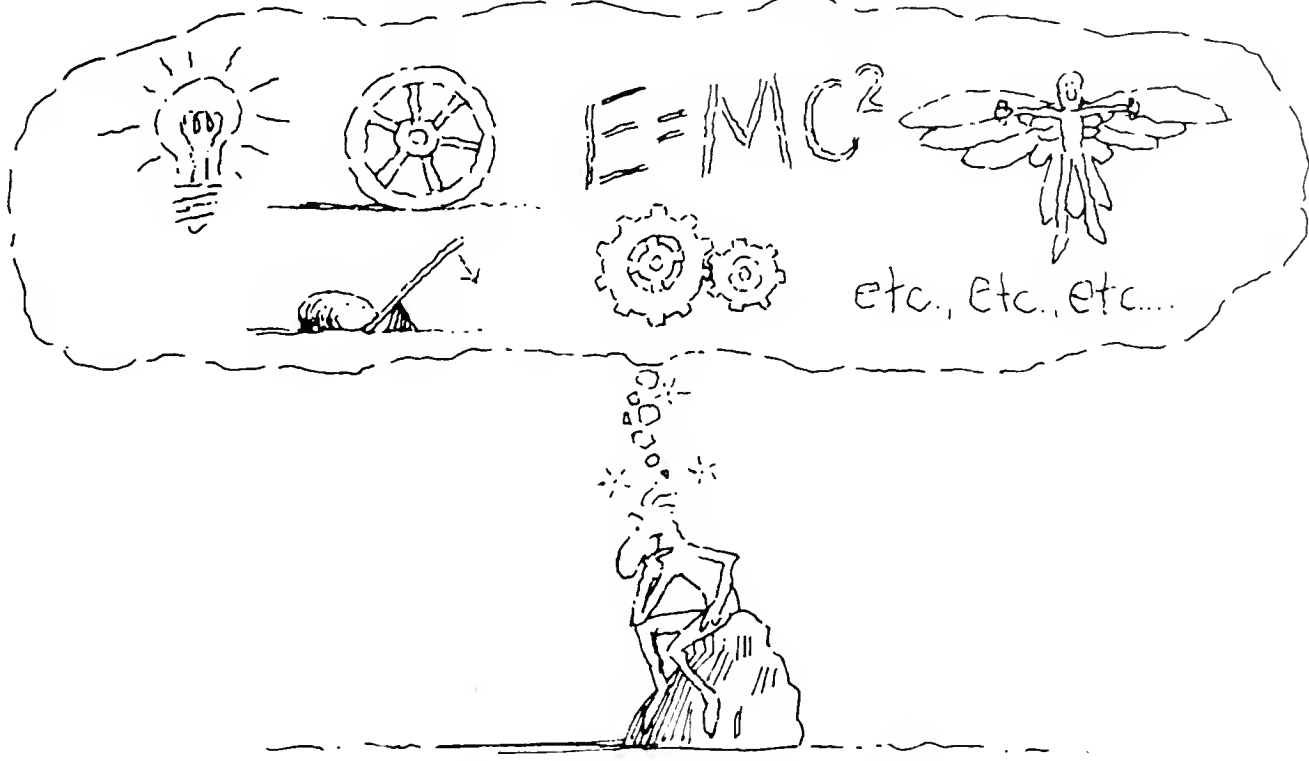
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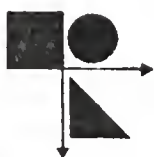
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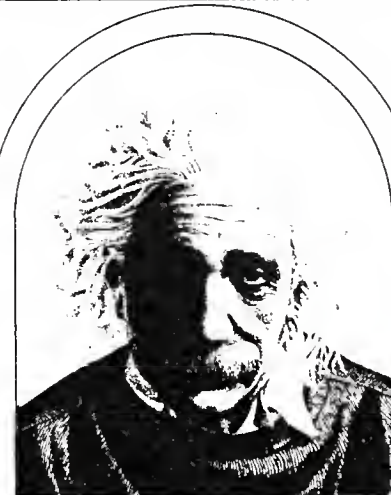
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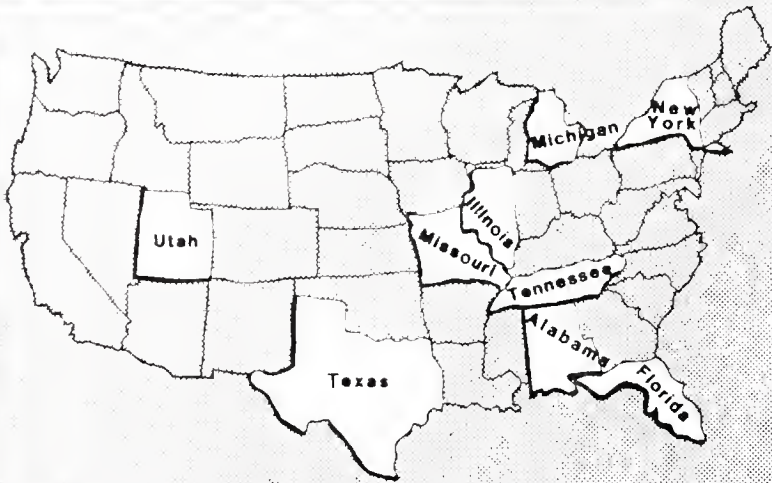
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Project director who will act as manager for the installation of a college administrative computer system. This position requires experience with management information and word processing systems having many components including finance, accounting, admissions, registration records, development and alumni, and student services. Strong ability to conceptualize large system operation while maintaining a thorough understanding at the technical level is a necessity. Good verbal and written communication skills to interact with administrative staff members who have varying levels of experience in the use of automated systems is necessary. The responsibilities of the Project Director includes: active participation in the choice of such facilities, coordinating physical requirements and logistics of installation, write up software specifications based upon users needs of accepted vendor, organize documentation activities and user training services. There will be a cooperative relationship with the Director of the college academic computer center which presently utilizes a DEC 11/70 System. An undergraduate degree is required and experience in an academic environment is desired.

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Please send all information to the Director of Personnel, Merrimack College, North Andover, MA 01845. All inquiries will be acknowledged. The closing date is April 29, 1983. Position available immediately. The search committee, recommending to the President, will be comprised largely of users.

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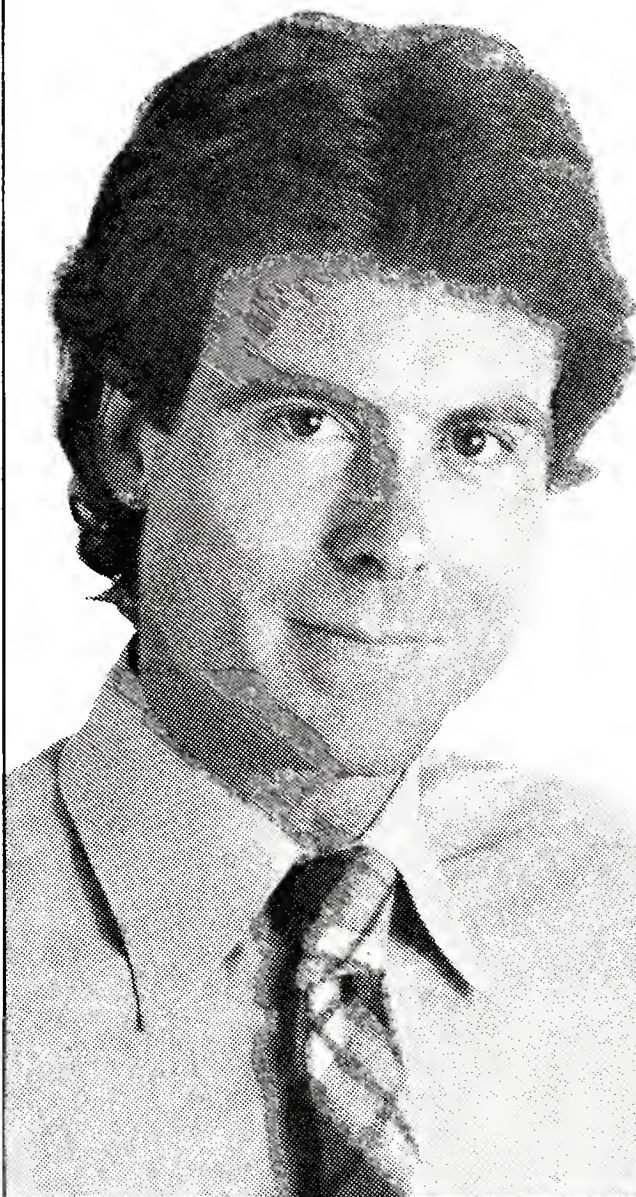
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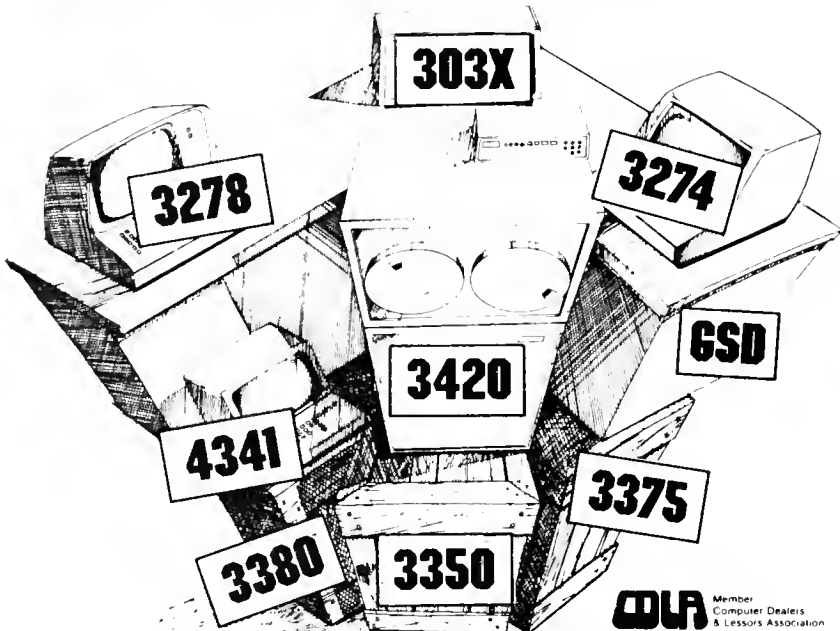
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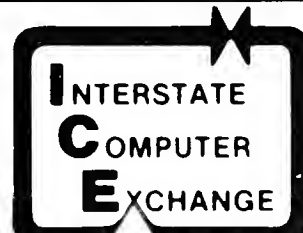
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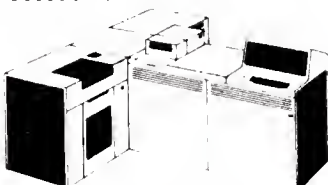


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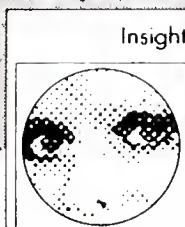
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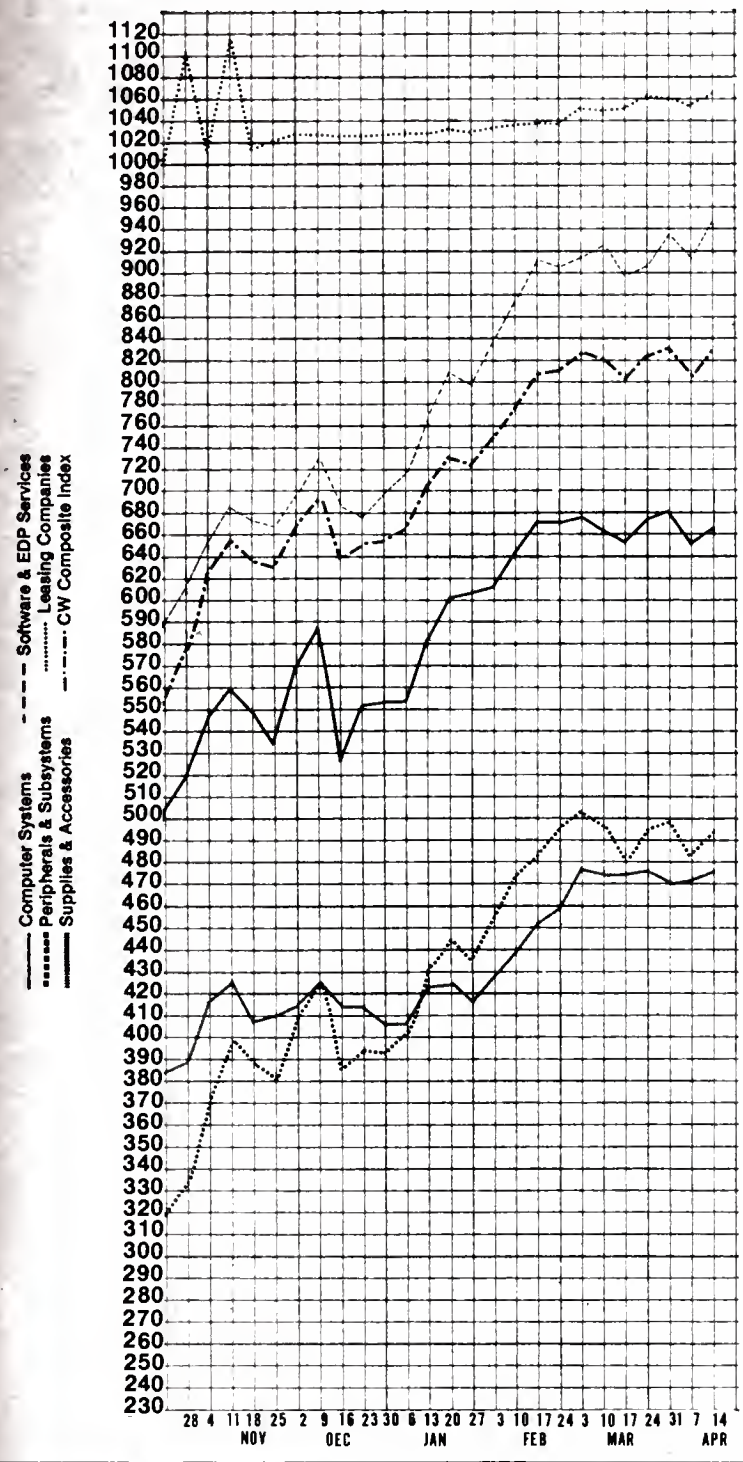
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Computerworld can be purchased on 35 mm microform through University Microfilm Int., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. Computerworld is indexed: write to Circulation Dept. for subscription information.

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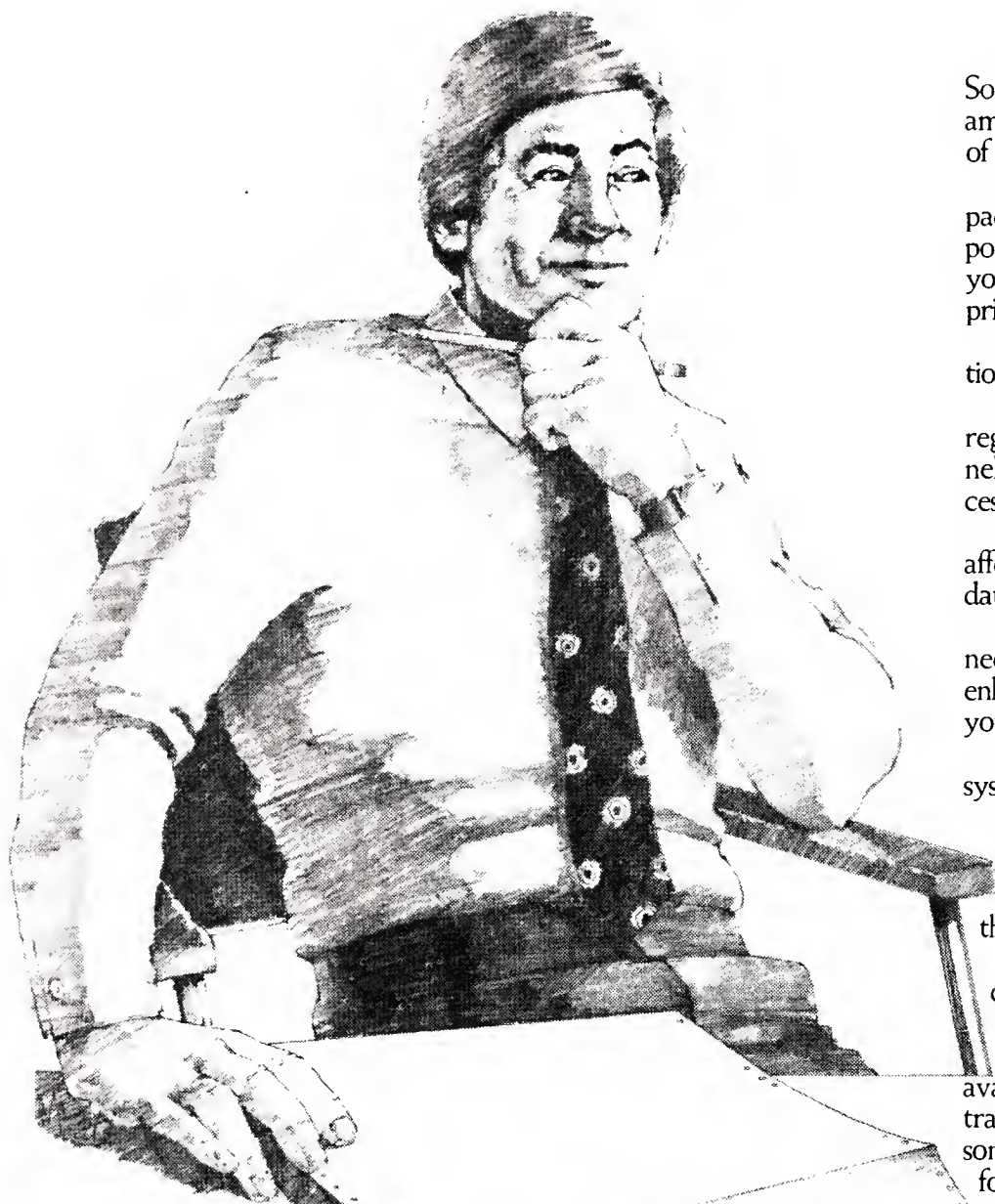
CLOSING PRICES WEDNESDAY, APRIL 13, 1983

All statistics compiled,
computed and formatted
by
TRADE QUOTES INC
Cambridge, Mass. 02139

COMPUTER SYSTEMS					
E	X	C	H	PRICE	
				1982-83	1983
				RANGE	APR 13
				(1)	1983
				CHNGE	CHNGE
A	AMOHL CDRP	17-44	38 1/4	+ 1/8	+0.3
N	BURROUGHS CDRP	28-49	45 3/8	+ 7/8	+1.9
O	COMPUTER AUTOMATION	7-17	11 3/4	+ 5/8	+5.6
A	COMPUTER CONSDLES	15-44	34	+ 3/4	+2.2
N	CONTROL DATA CORP	21-51	47 1/2	+ 7/8	+1.8
N	CRAY RESEARCH INC	20-49	41 3/4	+1 5/8	+4.0
N	DATA GENERAL CDRP	20-65	61 5/8	- 1/8	-0.2
N	DATAPDINT CDRP	11-36	20 5/8	- 5/8	-2.9
N	DIGITAL EQUIPMENT	62-132	123	+2 1/4	+1.8
A	ECCO INC	6-12	11 1/4	- 1/8	-1.0
N	ELECTRONIC ASSOC.	5-12	9	0	0.0
N	FLOATINO POINT SYST	16-38	31 5/8	-2 1/8	-6.2
N	FOXBORO	22-43	36 7/8	+1 1/4	+3.5
O	FULLCRUM COMP GRP	1-3	1/4	0	0.0
O	GENERAL AUTOMATION	3-8	7 7/8	- 1/8	-1.5
N	HARRIS CORP	20-51	43 5/8	+1 1/2	+3.3
N	HEWLETT-PACKARD CO	36-87	80 1/8	+3 1/8	+4.0
N	HONEYWELL INC	80-104	92 3/4	+3 1/4	+3.6
N	IBM	57-108	108 3/4	+6 1/4	+5.8
O	IPL SYSTEMS INC	5-11	8 1/4	+ 1/4	+3.1
O	MAGNUSON COMP SYSTS	2-5	3	0	0.0
N	MANAGEMENT ASSIST	7-18	14 3/8	0	0.0
O	MINI-COMPUTER SYST	1-2	1 1/2	+ 1/8	+9.0
N	MODULAR COMPUTER SYS	6-15	10 1/2	+ 3/4	+7.6
N	MODHAM DATA SCI	10-19	15 1/2	- 3/8	-2.3
N	NCR	39-114	108 3/4	+2 3/4	+2.5
N	PERKIN-ELMER	17-33	27 1/8	+1 7/8	+7.4
N	PRIME COMPUTER INC	16-45	33 1/4	- 1/2	-1.4
N	SPERRY CORP	21-39	35 3/4	+1 1/8	+3.2
O	TANDEM COMPUTERS INC	14-34	27 7/8	+2	+7.7
N	TEXAS INSTRUMENTS	71-176	164 1/2	+2 3/8	+1.4
A	WAND LABS "B"	13-37	34 1/8	+2 5/8	+8.3
A	WAND LABS "C"	11-37	33 5/8	+1 5/8	+5.0
LEASING COMPANIES					
O	BOOTHE FINANCIAL CP	22-36	36	+3 3/4	+11.8
N	COMISCO INC	7-26	26	+3	+13.0
B	COMMERCE GROUP CORP	1-1	1/4	0	0.0
O	COMPUTER INVSRTS ORP	1-2	1/2	0	0.0
O	CONTINENTAL INFO SYS	5-22	17 3/4	- 1/4	-1.3
N	OFF INC	5-14	14	+2 1/4	+19.1
O	ITEL	1-3	1 1/8	0	0.0
O	LEASPCORP	1-2	1/8	0	0.0
N	U.S. LEASING	18-44	43 7/8	+4 7/8	+12.5
SOFTWARE & EDP SERVICES					
E	X	C	H	PRICE	
				1982-83	1983
				RANGE	APR 13
				(1)	1983
				CHNGE	CHNGE
D	ADVANCED CDMP TECH	1-6	5 1/2	+1	+22.2
O	ADVANCED SYSTEMS INC	9-24	21 1/4	+1 1/4	+6.2
O	AGS COMPUTERS INC	7-22	18 1/2	+2 3/4	+17.4
O	AMERICAN SOFTWARE	22-25	23	0	0.0
N	ANACDMP INC	9-23	20 3/4	- 5/8	-2.9
O	ANALYSTS INTL CDRP	5-11	10 1/4	- 1/4	-2.3
A	APPLIED DATA RES.	8-29	28	+1 1/8	+4.1
O	ASK COMPUTER SYSTEMS	12-35	32 1/8	+2 1/4	+7.5
B	ASTRADYNE CDMP IND	1-6	5 1/4	+ 1/2	+10.5
N	AUTOMATIC DATA PROC	21-40	35 3/4	+ 1/2	+1.4
O	CGA COMPUTER ASSOC	5-14	11 3/8	- 1/8	-1.0
O	COMPUTER ASSOC INT'L	12-49	49 1/4	+3 1/2	+7.6
O	COMPUTER HORIZONS	2-17	18	+1 1/2	+9.0
O	COMPUTER NETWORK	4-10	9 1/8	+1 1/2	+19.6
N	COMPUTER SCIENCES	11-23	18 1/4	-1 1/8	-5.8
O	COMPUTER TASK GROUP	8-19	18 1/2	0	0.0
O	COMPUTER USAGE	2-22	16 1/2	+ 1/4	+1.5
O	COMPUTONE SYSTEMS	15-38	21 1/4	+1 1/4	+6.2
O	COMSERV CORP	11-20	12 3/4	- 3/4	-5.5
O	COMSHARE	6-13	10 3/4	+1 1/4	+13.1
N	CULLINET SOFTWARE	12-35	34 3/4	+3 3/4	+12.0
O	CYCARE SYSTEMS INC	9-18	17	0	0.0
O	DATA DIMENSIONS INC	1-2	5/8	+ 1/8	+25.0
O	DATATAB	0-2	3/4	0	0.0
D	DYATRON CORP	2-4	3 1/8	+ 1/8	+4.1
N	ELECTRONIC DATA SYST	19-60	57 3/8	-2	-3.3
N	INFORMATICS INC	10-30	28 5/8	+2 3/8	+9.0
O	INSYTE CDRP	1-3	1 5/8	- 1/8	-7.1
O	IPS COMPUTER MARKET	1-2	1 1/8	0	0.0
O	KEANE ASSOCIATES	4-12	10	-1 1/2	-13.0
A	LOGICON	12-36	34 1/8	-1 3/4	-4.8
O	MNGT SCI AMER INC	8-28	20 3/4	-1 1/4	-5.6
D	MATHEMATICA INC	12-22	21 1/2	+3	+16.2
O	MATHEMATICAL APP GRP	12-22	19 1/4	+ 1/4	+1.3
O	NATIONAL DATA CORP	5-24	20 1/2	+ 1/4	+1.2
O	PANSDPHIC SYSTEMS	8-25	21 3/4	- 3/4	-3.3
N	PLANNING RESEARCH	6-16	15	+ 1/8	+0.8
O	POLICY MGMT SYSTS CP	36-51	46 3/4	+3 1/2	+8.0
O	PROGRAMMING & SYS	1-4	3 1/2	0	0.0
O	REYNOLDS & REYNOLD	17-39	34 1/2	+2 1/2	+7.8
O	SEI CORP	11-25	23 1/2	0	0.0
O	SHARED MEDICAL SYST	13-36	34 1/2	+ 1/4	+0.7
O	SCIENTIFIC COMPUTERS	6-13	11 3/4	0	0.0
O	SOFTWARE AG	5-17	8 5/8	+ 1/8	+1.4
N	TYMSHARE INC	12-30	19 3/8	+1 1/8	+6.1
A	URS CORP	5-14	12 1/2	+ 1/4	+2.0
N	WYLY CORP	7-13	12 3/8	+ 1/8	+1.0
PERIPHERALS & SUBSYSTEMS					
P	A	M	I	N	T
A	AM INTERNATIONAL	2-4	3 5/8	+	+1.7
A	ANDERSON JACOBSON	9-26	19 1/4	+2 7/8	+17.5
D	AUTO-TROL TECHNOLOGY	8-21	13 1/4	+ 3/8	+2.9
O	BANCTEC INC	7-23	16 3/4	+ 1/2	+3.0
A	BEEHIVE INT'L	4-11	9 7/8	0	0.0
A	BOLT, BERANEK & NEW	13-40	40 3/8	+ 1/2	+1.2
O	CAMBEX CORP	2-4	1 3/4	0	0.0
N	CENTRONICS DATA COMP	6-20	17 3/4	- 1/2	-2.7
A	CETEC CORP	4-10	9 3/4	+1 1/8	+13.0
D	COGNITRONICS	2-14	10 3/4	- 1/4	-2.2
D	COMPUTER COMMUN.	1-2	1 3/4	0	0.0
SUPPLIES & ACCESSORIES					
N	D	B	A	M	I
N	AMERICAN BUS PRDSS	11-24	24 3/8	+1 3/8	+5.9
D	BALTIMORE BUS FORMS	1-2	3/4	0	0.0
N	BARRY WRIGHT	13-25	25 3/8	+ 1/4	+0.9
O	CYBERMATICS INC	1-1	1 1/4	0	0.0
A	DUPLEX PRODUCTS INC	12-23	22 7/8	+ 7/8	+3.9
N	ENNIS BUS. FORMS	16-34	33 1/4	0	0.0
N	3M COMPANY	49-82	77 3/8	+1 1/2	+1.9
N	MOORE CORP LTD	26-47	47	+ 1/8	+0.2
N	NASHUA CORP	9-19	12 3/4	0	0.0
D	STANDARD REGISTER	32-85	82	+ 1/2	+0.6
N	WALLACE BUS FORMS	22-56	50 1/2	-1 1/4	-2.4

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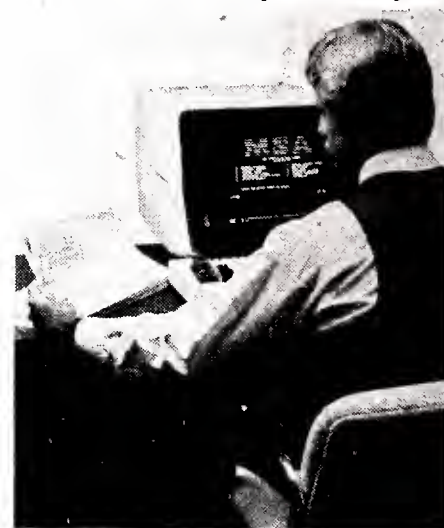
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